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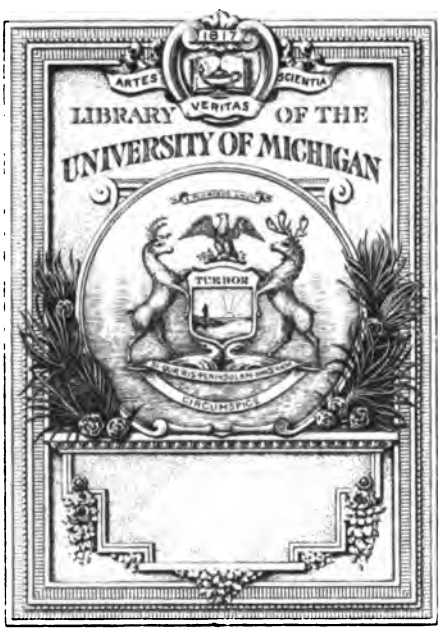
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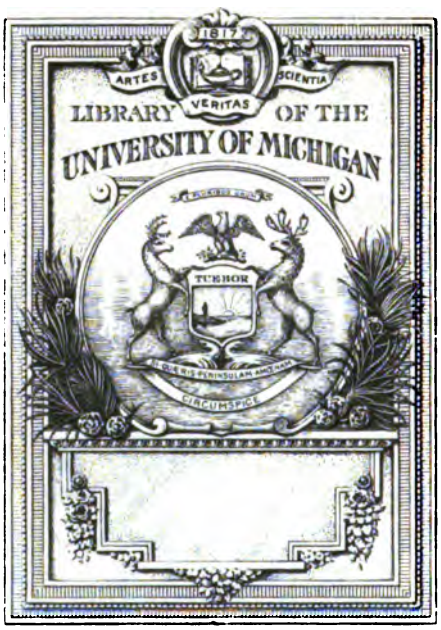
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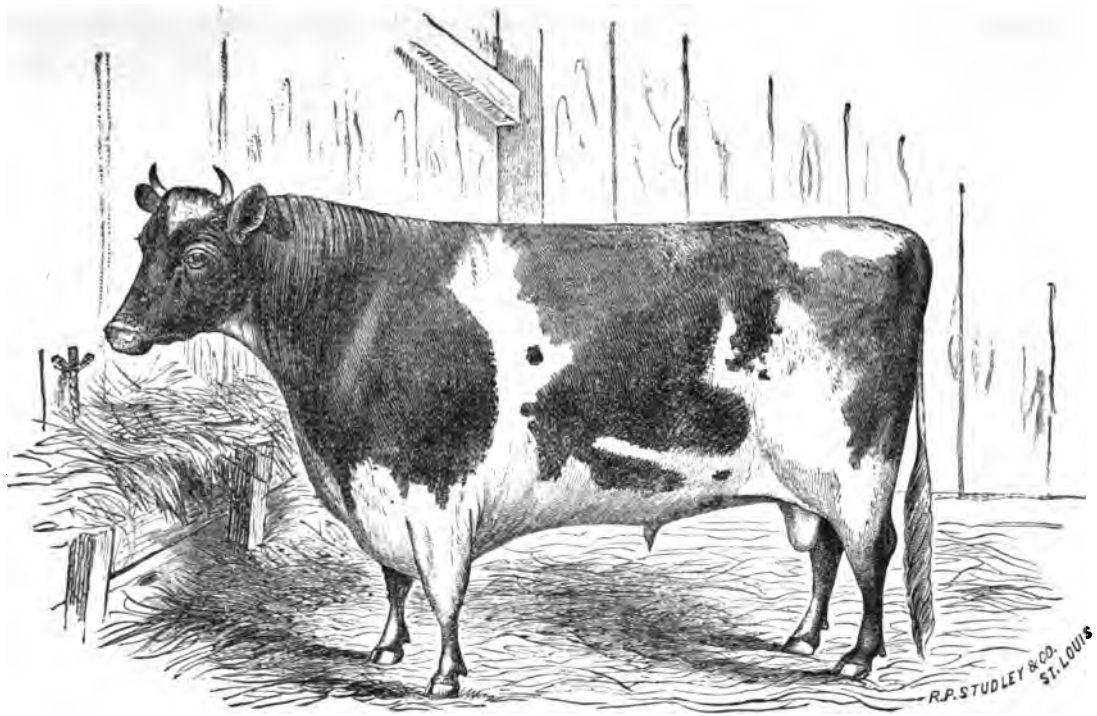

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SECOND ANNUAL REPORT

OF THE

MISSOURI STATE BOARD OF AGRICULTURE,

WITH AN

ABSTACT OF THE PROCEEDINGS

OF THE

COUNTY AGRICULTURAL SOCIETIES,

TO THE

GENERAL ASSEMBLY OF MISSOURI, FOR THE YEAR 1866.

The public printer shall, annually, under the direction of the president of the state board of agriculture and the president of the state horticultural society, print and bind, in one volume, six thousand copies of the annual report of the said board of agriculture and the proceedings of the state horticultural society, thirty-eight hundred copies to be for the use of the general assembly, two hundred for the state library, one thousand copies for the state board of agriculture, and one thousand copies for the state horticultural society, for distribution to the agricultural, horticultural and mechanical associations throughout the state.—*Section* 10, *Chapter* 59, *Revised Statutes of Missouri.*

JEFFERSON CITY:
EMORY S. FOSTER, PUBLIC PRINTER.
1867.

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NOTICE.

In presenting the second annual report on agriculture to the farmers of Missouri, we think we are fully warranted in saying that it will be found to contain much more desirable information and many matters of more practical interest than the first report. The first volume was received with a remarkable degree of favor and interest, although it was very justly criticised in some respects. All, however, who were disposed to do justice and make a fair allowance for the peculiar circumstances and difficulties under which it was prepared, have been pleased and satisfied with the work.

The subject of the locusts, or grasshoppers, as they were called, which invaded the state from the west last fall, and which may cause the farmers serious trouble the coming season, has received attention, and about as much as is known concerning this pest will be found in this volume.

The Texas cattle plague has excited an unusual degree of interest the past season throughout the whole country. The farmers of Missouri and surrounding states have lost heavily by it. It is an obscure disease, and it is hoped that the board of agriculture may hereafter have the means to thoroughly investigate it and determine, if possible, its nature, cause, origin, habitat, mode of propagation, etc. It is probable that there are localities in Texas and other southern regions not subject to the disease, and from which cattle might be brought into this State with safety. The magnitude of the losses by this disease makes it a matter well deserving of thorough investigation, and it would be well if each of the states most interested would appoint a competent commissioner to act unitedly in such investigation. Many interesting facts in regard to it have been obtained and embodied in this report.

Several important and remunerative crops, heretofore comparatively neglected in our state, and some of them just now receiving

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an increased degree of attention, are noticed and treated of to some extent in this report. Prominent among such may be mentioned the hop. For the purpose of more thoroughly awakening an interest in this crop, to which our state seems to be well adapted, we have given an illustrated article, and indicated the source from whence more light may be obtained by those seeking it. One of the crops too much neglected in our state, and most seriously so, is grass. With this view we have introduced a unique and peculiarly piquant agricultural address by Solon Robinson, on the subject What is Grass? It will be read with interest and profit.

The subject of manufactures is one of first importance to Missouri. It is undoubtedly true that no purely agricultural country can become wealthy. The board of agriculture offered a premium for the best essay on this subject, which was awarded to Mr. John F. Madison, of St. Louis. It is a valuable contribution to this report.

The contribution of Prof. Swallow, on the physical geography of the state, from the unpublished notes of the geological survey, is a very valuable one, and will be read with great interest, not only by our own citizens, but by those of other states and countries.

The contributions of Mr. G. C. Broadhead, an assistant in the geological survey, are interesting as showing further the character and resources of the state.

The proceedings of the state horticultural society possess perhaps rather more than their usual interest. The essay on the Apple, by Willard C. Flagg, in particular, shows a good deal of thorough research, and is a very interesting production.

The fairs of the St. Louis agricultural and mechanical association have exceeded in magnitude and importance those of any other locality in the Union. They have been more than equal, in some respects at least, to the state fairs of any other state. Our own citizens and the citizens of other states have taken so deep an interest in these fairs that it has been considered desirable to incorporate in this report a full report of the St. Louis fair of 1866, the first since the war, and quite equally successful with any of the former ones.

Contributors and correspondents have the thanks of the board of agriculture, and we trust the thanks of every citizens of the state.

L. D. MORSE,
Corresponding Secretary.

St. Louis, February 7, 1867.

BOOKS, PAMPHLETS AND PAPERS,

RECEIVED BY DONATION AND EXCHANGE.

Colonel B. P. Johnson, Albany, New York, Secretary New York State Agricultural Society: Transactions for 1865.

John H. Klippart, Columbus, Ohio, Secretary Ohio State Board of Agriculture: ten volumes Ohio Agricultural Report for 1865.

S. L. Goodale, Saco, Maine, Secretary Maine Board of Agriculture: twenty-five volumes of Agriculture of Maine for 1865.

Sandford Howard, Secretary Michigan Board of Agriculture: Agricultural Report for 1865.

J. M. Shaffer, Fairfield, Iowa, Secretary: six volumes of the Iowa Agricultural Report for 1865.

John P. Reynolds, Springfield, Illinois, Secretary: twenty copies transactions Illinois State Agricultural Society.

Hon. H. T. Blow: copies report of the Department of Agriculture for 1863 and 1864.

Isaac Newton, Commissioner: Monthly Reports of the Department of Agriculture.

Newspapers: State Times, Jefferson City; Sedalia Times, Sedalia; North Missouri Messenger, Mexico; Colman's Rural World, St. Louis; Prairie Farmer, Chicago.

REPORT

OF THE

CORRESPONDING SECRETARY.

To the General Assembly of the State of Missouri:

In accordance with the requirements of the organic act creating the board of agriculture, I proceed to lay before you such "a general view of the condition of agriculture throughout the state" as I am able to do with the facts and information obtained.

The past season was somewhat peculiar, though not sufficiently so to make it vary greatly from the usual average. The spring was, in most localities, considered backward, "cold and wet." Much difficulty has been experienced in getting accurate facts in regard to the seasons or climatology of the state, on account of the lack of correct observations in the different localities. Arrangement should be made to supply the proper instruments to a dozen different persons in different parts of the state who will make observations, so that by the comparison of tables for a series of years valuable facts in regard to our climate may be developed. Agricultural resources are largely dependent upon climate. The seasons seem to vary considerably in the different portions of our state in many particulars. It would be interesting and important to know how these variations agree through a series of years in all particulars.

Dr. George Engelman, of St. Louis, has kept a careful and minute meteorological record for the period of about thirty years. In regard to the spring of 1866, he says: "The temperature, in March lower than the average, was in April much higher, and in May considerably lower again. But the most remarkable feature of the climatic appearance of the last two months (April and May) was their unusual dryness. The quantity of rain that fell in the two months together did not amount to the average quantity for April alone, and was much less than the avearge quantity for May. I have, in twenty-eight years, not observed as little rain in May as this year.

"The atmospheric condition of the spring (March, April and May) was marked by its great dryness, the quantity of rain having been

about half the average for the season, and was not much more than one-third of what it amounted to last year. We had fewer thunder storms than usual, but the number of fair days was less; the proportion of cloudiness was greater than commonly, and greater even than last year with all its rain."

By comparing the foregoing statement, which is certainly correct, with the reports from various parts of the state regarding the "cold and wet" spring, it may be thought that farmers who have trusted more or less to memory in making reports, have been greatly mistaken in regard to the character of the spring. This is probably not so much the case as might at first appear. The spring was undoubtedly generally backward and unfavorable for spring work, and the unusual cloudy weather may have left an impression of more cold and wet than was really the case. The amount of rainfall, however, varies greatly in different localities in the State. According to the monthly report of the agricultural department at Washington, the rainfall at five different points in Missouri varied in the month of April from 1.73 inches in St. Louis to 6.92 inches at Harrisonville, in Cass county. In the month of May it varied from 0.73 inches at Athens, in Clark county, to 5.42 inches at Harrisonville. At St. Louis the fall was 2.24 inches.

At the end of the corresponding secretary's report will be found a table in regard to seasons, crops, etc., made up from the reports of correspondents in various parts of the state. Also, I have appended to the county reports many such communications entire, deeming them of sufficient value as showing more fully the condition of agriculture. I hope it will be sufficiently apparent that more correct observations in a sufficient number of localities would be desirable, and that the means will be provided for securing them. I trust the legislature will consider this matter, and place at the disposal of the commissioner of statistics a sufficient sum, say one thousand dollars, to be expended in procuring the proper instruments, blanks, etc., which may be placed in the hands of proper persons in different parts of the state, who will give the necessary security for their safe keeping, and agree to make careful observations and correct returns to the commissioner.

In the months of July and August, a drouth of considerable severity prevailed in most portions of the state, considerably diminishing the yield of grass, corn and potatoes. The northern and eastern portions of the state seem to have suffered most, while the southern and southwestern portions were more favored, and the crops were all good. Corn, however, was to some extent injured in both northern and southern portions of the state by an unusually early frost about September 20th.

In the southern portion of the state, mostly south of latitude 38½, the peach crop was fair, while north of that line, it was almost an entire failure. The apple crop in the central eastern portion of the state was considerably short of the usual yield. In many other parts,

particularly westward, the crop seems to have been better, and very remunerative prices were obtained.

The grape crop, which is becoming yearly of much greater importance, has this year been usually good. In the northern part of the state the crop was somewhat injured by the severe cold of February preceding. In the central and southern portions the crop was about a fair average. On the whole, there has been very little cause for complaint in regard to the crops throughout the state.

In some parts of the state heavy rains in September interfered with sowing fall grain, and in those parts less was probably sown than would have been otherwise, and much was sown late.

One remarkable fact of the past season, was the incursion in the western part of the state of a vast army of locusts or grasshoppers, as they have been called. They came from the west, and traveled as far in this state as the central part of Johnson county, before cold weather stopped them. They extended as far south probably as Texas, and to some extent north of the Missouri river. They ate everything green before them, and it is thought that they have eaten wheat down into the ground to such a degree that it is not likely to start again. Their appearance in this state was too late in the season to do a very serious amount of damage, except to the wheat crop. They have left an innumerable amount of eggs in their track, and if these eggs should hatch out in the spring or early summer, as there is reason to fear, the devastation which they will make will be truly fearful.

Mr. Smith, of Cuba, Missouri, communicates the following:

"I have seen in the papers a report that a portion of Kansas and the western part of Missouri was visited by grasshoppers during last summer, in such numbers as to cause much damage to the growing crops. As a knowledge of the habits of this destructive insect can only be known by experience, I have thought it might be useful, and at least entertaining, to even general readers, to learn from a 'sufferer' something on that subject. Grasshoppers made their appearance in the northern inhabited parts of Minnesota, in great numbers, in July, 1856. On Crow Wing river, about one hundred and fifty miles above St. Paul, on an Indian reservation, where considerable grain was being raised, is the most northern limit of any known destruction from them at that visitation. They extended down to or some distance below St. Paul. On their appearance at the settlement in Crow Wing, the oats (a principal crop there) were about a foot high. They ate off the tops and blades and passed on, making their stay short in that immediate neighborhood. They came from the northwest, and seemed to move in a southerly course from there. After the grasshoppers left that settlement, the oats, not having been cut off below the heart or germ of the plant, still made from five to ten bushels per acre, but presented a singular appearance at harvest of naked stalks, crowned with grain, but with no side blades. Potatoes seem to have been the principal crop, besides oats, raised in that section, but they were not

seriously injured. I think there was but a narrow strip of country in the most northern limit of their appearance that escaped so easily. They laid no eggs there, and were not there the second year. A few miles further south they remained longer, and their destruction was of a more permanent character. Some damage was also done to the corn. Here they commenced to deposit their eggs. Wheat and rye was seriously, but not fatally, injured, being too far advanced in growth. As a traveler through that country, I saw them for the first time in August of that year. They were then perfect insects, but somewhat decreasing in numbers. Their enemies were numerous—hogs, hens, turkies and all the feathered tribes. I have seen an old sow with a large litter of pigs in full pursuit. The grasshoppers would fly three or four rods and alight, to find their enemies ready, with open mouths, to receive them, when another flight would end with similar results. In the same way old hens and motherly turkies found abundant and profitable employment for their numerous progeny, while they did their country some service. Thus the grasshoppers gradually wasted away between their enemies, assisted by an occasional autumnal frost, which sometimes comes somewhat untimely in that latitude, but not before they had perforated the earth with holes about one-fourth of an inch in diameter, and, as was afterward proved, deposited eggs enough to renew their generation with compound interest. After the grasshoppers were gone, the people—good, easy souls—with the exception of an occasional 'croaker,' thought no more of it. True, their crops were sorely reduced, but then the chickens and pigs had taken signal vengeance on the depredators. Most people were prepared to quit, not dreaming that any trouble was to come from those 'little holes in the ground.'

"The spring of 1857 dawned usually bright (I was then a resident), and about the 20th of May the most sunny spots of that sandy soil had not only quickened into life early vegetable products, but a nearly white insect, about the size of a grain of wheat, began to be observed by the 'curious,' crawling out of the ground in great numbers, their limbs and wings so neatly folded as to almost deceive the 'very elect.' Exposure to a few hours' sun so deepened their color and developed their faculties that they appeared to be grasshoppers to the most transient observer. They immediately commenced to eat. Early vegetables, as onions, lettuce, asparagus and tender grasses, seemed especially adapted to their taste, and appetites were by no means wanting, and seemed to grow with their growth, till wheat, rye, corn, potatoes and every vegetable product, native or cultivated, disappeared before them. Even the leaves on the trees and the prairie grass were sadly denuded in many places, and asparagus, which bears repeated and severe cutting, was killed outright. In short, all cultivated crops were totally destroyed, and the country left a comparative desert. In the meantime, no part of any habitation was secure from their prying curiosity. Like the frogs of ancient Egypt, they found their way into

the kneading troughs, closets and most secret places, and were by no means desirable occupants. Their filth was everywhere, and their teeth tried every fabric. So universal was the destruction and so desolate the usually bright face of nature at that season of the year, that a solitary pumpkin vine, which, by some unexplained cause, had escaped them, was the subject of universal admiration—was declared beautiful.

"By their constantly increasing activity and rapacity they became a terror to the inhabitants; at times all the grasshoppers in a given district would make a rush in one direction (generally with the prevailing wind) and then nothing would stop their progress. In their attempts to cross the Mississippi, they would swarm out on any projecting log, canoe or ferryboat, and pour off of the extreme end like grain from a hopper—their webbed feet seemed to sustain them quite well on the water. I have no doubt they often effected a crossing if the water was still and smooth; they never attempted to fly across the river.

"This state of things continued till about the 8th of August, when, as by a concerted movement, about the middle of the day, they rose to a great hight in the air, obscuring the sun in many places and looking like a snow cloud. In the bright atmosphere they moved off in a southwest course, leaving a sorry-looking country behind. While universal famine stared the people in the face, they rejoiced in the fact that the grasshoppers were gone and left no eggs behind. Many people at that late season, in desperation and as an only resource, planted potatoes—or rather, had been replanting all the time—in expectancy of this hoped-for event, and such was the effect of the warm sandy soil and a hot August sun, that good crops of late potatoes were obtained, and helped much to carry the suffering inhabitants through a season of great scarcity and privation."

In order to give the best and most complete information in regard to this pest, we copy from the Practical Entomologist an article prepared by its editor, Mr. Benjamin D. Walsh, of Rock Island, Illinois, one of the best entomologists in the country. Mr. Walsh strongly recommends the offer of a bounty of so much a bushel for grasshoppers' eggs, on the same principle that bounties are offered in most new states for wolfscalps. The subject is well worth considering:

GRASSHOPPERS AND LOCUSTS.

Shakspeare has said that a "rose by any other name would smell as sweet," and I suppose that, by parity of reasoning, he would infer that "a skunk by any other name would stink as strongly." But Shakspeare was a poet, not a philosopher. There is a great deal in a name. Call any given kind of caterpillar the army-worm, and people are immediately alarmed about it, and fancy that it is going to sweep the whole country before it. Tell them of a swarm of grasshoppers alighting from the clouds in any country, and it excites but little attention. But call the very same insects a devouring swarm of locusts, and they immediately think of King Pharaoh and the desolated land of Egypt, and are filled with horror and apprehension.

Now, at this present moment, enormous clouds of what are, properly speaking, locusts, are ruthlessly desolating Kansas and Nebraska, and some of them even passing into Missouri. Yet, as

the American people choose to call these insects grasshoppers, and grasshoppers are quite common throughout the United States, nobody thinks much about it. In reality, however, the species which is doing the damage, as well as most of the insects popularly known as grasshoppers, belong to the very same family of insects as the locusts of scripture and of modern Europe; though, as is the case with about 95 per cent. of the various insects found in North America, the species differ from any that occur in the old world. It is to Professor W. S. Robertson, of the Indian orphan institute, Highland, Kansas, that I am indebted for specimens of the very insect which is now actually infesting Kansas, though more than a year ago I had been supplied with specimens of the same species taken by my friend Dr. Velie, in Colorado. Singularly enough, this insect has never yet, so far as I am aware, been scientifically described; but as Mr. Uhler, without describing it, has given it the name of caloptenus spretus, we may designate it in that manner. It differs from the common red-legged grasshopper (caloptenus femur-rubrum), which occurs everywhere east of the Mississippi river in great abundance, chiefly in all the four wings being very much longer, so that, instead of flying only a few yards at a stretch, it can with ease fly a great distance. In a female specimen of the former, which I have measured, the wings expand from tip to tip 2 2-10 inches, and the front wing is 1.03 inches long; in a female specimen of the latter, of exactly the same size, they expand only 1⅛ inches, and the front wing is only 0.80 inch long. In the male sex the difference is not quite so great, but still it is sufficiently characteristic. And these differences are found to be constant and permanent, and not to occur in a few specimens only of each species, and to pass by insensible gradations from one species to the other. Hence, in spite of the almost absolute identity of all the other characters, we are bound to consider the two insects as distinct species. Whether they have always been thus distinct for all preceding time, is another and a very different question. According to Dr. Velie, who supplied me with specimens from Colorado, it is this same caloptenus spretus which often does great damage in that territory; and there can be little doubt that it is the same insect which has from time to time invaded Minnesota. The name spretus means despised, and refers apparently to its having been hitherto despised or overlooked by entomologists. In fact, as before stated, I believe that this is the first occasion on which it has been mentioned in print in such a manner that it can be scientifically identified. We may call it in English the hateful grasshopper.

Before I proceed to recount the ravages of this "hateful grasshopper," it may be as well to state, for the thousandth time, that the insects popularly called "locusts" in North America have nothing whatever to do with the locusts of scripture and of modern Europe, and do not even belong to the same order, or to the same grand group of orders. The former are "suckers;" the latter are "biters." The former belong to the order homoptera; the latter to the order orthoptera. The former have their front wings glassy and transparent; the latter have them more or less leathery and opaque. The former have a mere apology for antennæ, which the general observer would entirely overlook; the latter have quite conspicuous and rather long antennæ. It is to the former that the so-called "seventeen-year locust" (cicada septendecim) belongs; but, as the term "locust" gives rise to so much confusion, it would be better to drop it altogether and call this insect "the seventeen-year cicada." It is remarkable that although these American bogus "locusts" (or cicadas) are physically incapable of eating, seeing that they have no jaws to eat with, yet the earliest account we have of them asserts that "they did eat up the green things, and made such a constant yelling noise as made the woods ring of them and ready to deafen the hearers." (Morton's Memorial.) This is an amusing specimen of the slipslop way in which natural history was written by our grandfathers, and of the influence of a mere name upon the imagination. The insect being popularly called a "locust," Morton naturally inferred that it must act like the "locusts" of which he had read in the Bible.

But insects are not the only animals among which popular names have caused great confusion in America. In some parts of the United States a species of grouse (tetrao umbellus) is called a "partridge," and, in other parts, the quail (ortyx virginianus) is called a "partridge." And almost everywhere two entirely different mammals, the thirteen-striped ground-squirrel (spermophilus 13-lineatus) and the pouched gopher (geomys bursarius) are confounded under the common name of "gopher." Nor are similar cases wanting in Europe. In many English counties sheep of a particular age are called "hoggets," and often, for the sake of brevity, "hogs;" and on one occasion a London gentleman was recommended by a neighboring farmer to turn thirty or forty "hogs" upon his lawn, in order to improve the grass. As the Londoner understood the word "hog" to mean "swine," and adopted his neighbor's advice to the best of his own understanding of it, the result may be readily guessed. Quite recently, in a grave English work on architecture, I met with a similar story, which the author vouches for as true. It seems that in the brewers' business molasses is extensively used in England, and is technically known as "Spanish." Sifted coal-ashes are also extensively used for grinding up along with clay in the manufacture of bricks,

near London, and are likewise popularly known among the brickmakers as "Spanish." On one occasion a London brewer, being about to build a large brick house in the country, sent a master brickmaker down there to report on the quality of the clay. The answer was that he could make first-rate brick with it, if he only had a load or two of "Spanish," meaning, of course, coal-ashes. Greatly surprised at such a demand, but having much confidence in the man, the brewer forthwith sent off to the brickmaker two cart-loads of "Spanish" in his own sense of the term, i. e., molasses. The result may be easily imagined.

After these preliminary remarks, I will now give such details as I have been able to collect respecting these destructive "grasshoppers," which ought by rights to be called "locusts," but which, if designated by that name in America, would make as much confusion as the English sheep-grower's "hogs" or the English brewer's "Spanish." It should be understood, however, that some of the insects which gather in great swarms in California and Utah, sweeping everything green before them, and are confounded with the true "grasshoppers" under the same popular name, belong to a closely allied family, the catydids (gryllidæ leach, or locustariæ latreille), and are mostly only furnished with very short rudimental wings. To this family evidently appertains the insect rudely figured in the Smithsonian Report for 1860 (p. 424) as infesting the Shasta valley in California, and it is not improbably the anabrus purpuratus of Uhler, which Dr. Velie took abundantly in Colorado. The "catydids" may readily be distinguished from the true "grasshoppers" (locustadæ leach, or acridii latreille) by the female always having a long sword-shaped ovipositor projecting from the tip of her tail.

THE HATEFUL GRASSHOPPER IN MINNESOTA, 1856-7.

"For two years in succession—1856 and 1857—the grasshoppers destroyed our crops, and many resolved then to keep two years' supply of produce on hand afterward. One fact I noticed: although they ate the bark from saplings, and consumed our corn, tobacco, etc., ate holes in clothes hanging out to dry, and destroyed boots and shoes when they lit on them in the house, yet peas they avoided, and it was an odd sight to see the field completely stripped, even of the weeds, and the pea-patch left undisturbed. There was no turning to the right or left with them; they went hopping on to the tune of John Brown, and they may be hopping yet for aught I know." (From a letter by O. H. Kelley, of Anoka Co., Minn., printed in the Country Gentleman, July 31, 1862.)

THE HATEFUL GRASSHOPPER IN NEBRASKA, 1866.

"In Nebraska the grasshoppers, according to the papers of Leavenworth, Kansas, had crossed Salt creek and Weeping waters, having come from the west, destroying everything in their course." (N. Y. Sem. Tribune, Sept. 25, 1866.)

"The grasshoppers, which have devoured everything about Fort Kearney, Nebraska, are rapidly approaching the river, and may yet sweep over Missouri. A few days ago they appeared in clouds at Seneca, Kansas, five miles west of St. Joseph, Mo. It is said that they will average one hundred to every square foot of surface." (From the Boston Cultivator, Sept. 22, 1866.)

The following is from the Nebraska correspondent of the Rock Island Union, and was printed in that paper September 25, 1866:

"NEBRASKA CITY, September 8, 1866.

"COL. BARNES: Fourteen miles northwest of Nebraska City, I have lately been a witness to a sight rare and singular to me. The last day of August, near the middle of the afternoon, quite a number of grasshoppers were seen alighting, and that number rapidly increased till a little before sunset. The next morning they appeared much thicker, but were only so from having crawled more into the open air to sun themselves. About nine o'clock they began to come thicker and faster from a northerly direction, swarming in the air by myriads, and making a roar like suppressed distant thunder. By looking well up to the sun they could be seen to good advantage, and could be seen as high as the eye could discover an object so small, in appearance like a heavy snow storm, each hopper very much like a very large flake, save that it passed by instead of falling. The number was beyond imagination—the leaves of the timber in this section of the territory would be but little in comparison. The air was literally full of them, and continued so till along in the afternoon, when the air was free from them, countless millions having passed on, leaving other countless millions covering the earth to devour vegetation. Sunday and Monday being cloudy and damp, they contented themselves by devouring every eatable thing that came in their way, but Tuesday brought a repetition of the scene of Saturday. Since then they have not flown so much, and, at this writing, there are millions of them in this neighborhood, fortunately working their way

a little east of south. I could not say 'Go, erring sisters, go,' but I could heartily say, 'Go, you famine-creating, pestilential, devouring nuisance, and as you pass over water, forest and prairie, may the fishes of the water, beasts of the forest and fowls of the air grow fat upon your little carcasses, till the last one of you finds your last camping ground in the power of some hungry enemy.'"

Their present visitation may be for some good, but I am too blind to see it. Their ravages here have drawn down many a hearty yet uncouth expression of disgust and hate from honest and hard-working farmers. Go into the gardens and see them stripped of nearly every vestige of vegetation, both stock and fruit; go into the field and see the vines of all sorts stripped of all their leaves and eaten to the ground; go and see the corn, as completely naked as if some violent storm had torn every blade from the stalks, leaving it looking like a lot of degenerate hoop-poles; go into the orchards and timber and see many of the smaller trees especially, almost bare, the leaves having been devoured by these ravaging creatures. Many a sad sight and many a downcast countenance now fill the roll. May a new tide in the affairs of the farmers here better their footing next year.

Yours, as ever,

S. C. MAXIMA.

THE HATEFUL GRASSHOPPER IN KANSAS, 1866.

From a letter from Prof. W. S. Robertson, of Kansas, dated September 12, 1866, and accompanied by numerous specimens of the perfect insect:

The grasshoppers sent herewith are popularly known here as the "Mormon," "Western," or "Colorado" grasshoppers. Last month they made their appearance in the frontier settlements of Kansas and Nebraska. To-day I was expecting specimens to send you, and they came—not a pill-box full but in clouds. As high as the eye could reach the air was filled with them; and they came down glittering in the sunlight like huge flakes of snow, and at once commenced their vocation of destroying every green thing. Indian corn, however, seems their favorite food, and they promise to be as destructive to it as their neighbors, the spearman, have been to the potato. On the Nemaha the late corn has been entirely destroyed by them. Even where some men hastily cut up and shocked their corn, the grasshoppers continued their depredations, until only the bare stalks remained. Wheat, when sown, was eaten up, if left uncovered.

In many places the ground is fairly honeycombed by their egg-cells, which are from 3-10ths to 5-10ths of an inch in depth. The common length of the egg-cells is 1 and 3-10ths of an inch; but by calling on a number of boys for a large one and a small one, I found the extremes to be 1 and 6-10ths and 9-10ths of an inch. I have observed that these grasshoppers are preyed on by certain species of libellula, (dragon-fly or snake-feeder).

The following is from the special correspondent of the New York Tribune, and appears in the semi-weekly of September 28, 1866:

COUNCIL GROVE, KANSAS, September 8, 1866.

Soon after noon, September 1, a tremendous shower of grasshoppers came from the south, completely filling the air as high as one could see, and looking like a driving snow-storm. In a few moments the ground, trees, bushes, and everything green was completely covered. In less than two hours the leaves of trees, bushes, corn and everything green was devoured. The weather since then has been cool and wet, so that they could not leave, as they move only in hot, dry weather. The grasshoppers are now lying thick over everything, eating the ears of corn, oats, all the bark off the trees and shrubs, watermelons, cucumbers, cabbage-heads, pumpkins, etc. It will be impossible to sow fall wheat here unless they leave soon. The wheat, oats, rye and barley crops were first-rate here this year. Corn is cut a little short by dry weather, and is cut down by grasshoppers; still there will be enough.

The following is from the New York Semi-weekly Tribune of October 5, 1866:

John A. Nottenstein, Humboldt, Allen county, Kansas, writes September 11: Yesterday the red-legged locusts made their appearance in this vicinity, and are devouring everything green. They almost darken the sun in their flight. I put in sixty-five acres wheat in the last week of August, which looked fine, but it has nearly all disappeared. By to-morrow night there will not be a spear left. Early sown wheat will be totally ruined. You will probably hear that they (the locusts) are grasshoppers, but rest assured they are not. We suppose this to be the same pest which has devastated portions of Utah, Colorado, Nebraska and Minnesota.

The Lawrence (Kansas) Journal of September 12, 1866, speaks as follows of the grasshopper invasion:

In Brown county they covered a track twelve miles in width, and consumed pretty much every-

thing green. Trees were stripped of their leaves, grass eaten up, and corn-fields literally stripped to the stalk. It is fortunate they have come so late in the season as they have, after the crops have been principally gathered. They will, however, probably do great damage to wheat-fields, and if the fall should remain dry and warm, they will deposit their eggs, and, we fear, give trouble next year. A severe frost, followed by cold weather, would probably destroy these insects. They are now coming in this direction in swarms, and will doubtless be here in a few days. In northwestern Kansas they fill the air so as to obscure the sun. They have been traced for a distance of two hundred miles above Fort Kearney.

The Marysville Enterprise says of the grasshoppers in that section: "They alighted upon fields, gardens, fruit-trees, and everything green or eatable, and like a march of two hundred and fifty army corps, devoured everything they touched. This whole country has been taken by them, and the rear guard is still with us, guarding what vegetables and green leaves the army has left. Farmers are seriously alarmed lest the corn should be totally devoured. They seem to be passing in a southwest direction."

The following is from the New York Semi-weekly Tribune of September 25, 1866:

GRASSHOPPERS IN KANSAS.—The Leavenworth papers report that a vast army of grasshoppers have reached Lawrence from the west. They had cleaned out Topeka, the capital, of garden vegetables, grass and clover, and left the ground as if burned with fire. Corn is eaten to the roots. How widely they extend is not stated. They travel four or five miles a day.

Mr. William H. Lykins, of Lawrence, Kansas, writes to me as follows, under date of September 27, 1866:

With this I send you a few specimens of the grasshoppers or locusts of the ancients, which are now covering the land. All that you have ever heard or read of their vast numbers can now be seen in Kansas. Coming so late in the season they have not done much damage, except in a few cases where they have attacked fall wheat, corn-blades and tobacco. One gentleman informed me that they arrived on his farm about daylight, and before breakfast had completely eaten up a patch of tobacco of about five acres, and then sat on the fence and begged for a "chaw" from every one that passed. The latter part of the story is rather doubtful. They first made their appearance about Salina, high upon the Smoky Hill fork of the Kansas river, and from thence have spread over eastern Kansas. There is something weird and unearthly in their appearance, as in vast hosts they scale walls, housetops and fences, clambering over each other with a creaking, clashing noise. Sometimes they march in even, regular lines, like hosts of pigmy cavalry, but generally rush over the ground in confused swarms. At times they rise high in the air, and circle round like gnats in the sunshine. At such times I think they are caught by currents of our prevailing westerly winds, and are thus distributed over vast tracts of country. They are now depositing their eggs, and we shall probably have a second edition of them next spring. One farmer informed me that on his place there were about four holes to every square inch; and in some places I have seen their nests even thicker than this.

The following letter is from M. M. R., of Douglas county, Kansas, and bears date October 1, 1866:

The grasshoppers have made their appearance in this part of Kansas by the billion. They are now depositing their eggs in the ground, and almost every person is wondering if they will make their appearance next summer. We apply to you for information. Will their eggs hatch out next spring, and can they survive the winter without being destroyed? Farmers are predicting that we shall not be able to grow anything next summer on account of the grasshoppers.

How remarkably do the above graphic descriptions agree with that given by the prophet Joel of the locusts of scripture! "A day of darkness and of gloominess; a day of clouds and thick darkness. * * The land is as the garden of Eden before them, and behind them a desolate wilderness; yea, and nothing shall escape them! * * Like the noise of chariots on the tops of mountains shall they leap, like the noise of a flame of fire that devoureth the stubble, as a strong people set in battle array. * * Before their face the people shall be much pained; all faces shall gather blackness. They shall run like mighty men; they shall climb the wall like men of war; and they shall march every one on his way, and they shall not break their ranks. * * They shall run to and fro in the city; they shall run upon the wall; they shall climb up upon the houses; they shall enter in at the windows like a thief."—(Joel, Chapter II, 2—9.)

The facts referred to above, coupled with the circumstance that Dr. Velie found this same insect very abundant in 1864 in Colorado, and heard that it was by far the most troublesome and prevalent grasshopper there, indicates that it must have traveled from Colorado to Kansas and Nebraska in 1866, being probably assisted in passing the intervening barren plains by westerly winds.

There can be little doubt, I think, that wherever the insect has laid eggs this autumn, there the

great bulk of the eggs, unless previously destroyed, will hatch out next spring. In this event, the mischief will be a hundred fold as great as any inflicted in 1866. For then the country will have to subsist them, not only for a few weeks in the perfect or winged state, but for several months, while they are slowly and gradually attaining maturity. In confirmation of this theory, it may be observed, that in the case quoted above of their infesting Minnesota, they occurred in two successive years. It is possible, indeed, that some very peculiar weather, for instance very heavy rains, followed immediately by very heavy frosts, might destroy their eggs; but I would give but very little for such a chance.' As to their natural enemies—skunks, shrew-mice, moles, birds, toads, spiders, cannibal and parasitic insects, etc., it is out of the question that they can exist on the spot in sufficient numbers to make any impression upon such hosts of egg-cells as are stated to be already constructed. In a year or two's time such enemies might multiply, so as to form an efficient check to the future multiplication of this grasshopper. But, in their present numbers, which are of course proportioned to the numbers of the various species of insects, etc., usually found in Kansas and Nebraska, it is impossible that they can exert any influence upon so multitudinous a foe.

It might be supposed at first sight, if the hateful grasshopper can hatch out in Kansas and Nebraska in the spring of 1867, from eggs laid in the autumn of 1866, by females which had traveled thither from Colorado, and if, as I have stated to be likely, they can arrive at maturity during the summer of 1867 in Kansas and Nebraska, that in the autumn of 1867 they will lay a fresh stock of eggs there and propagate thus indefinitely from year to year. But there are scientific considerations which make such a contingency highly improbable. Dr. Velie, the Illinois ornithologist, and Dr. Parry, the Iowa botanist, both of whom were personally witnesses of the operations of this insect in Colorado in 1864, assure me that it breeds there in the mountains and comes down into the settlements in vast swarms through the canons (kanyons) or deep perpendicular cuts, leading from the mountains to the more level country. Hence, it is evidently a strictly alpine insect; and when it arrives in Kansas and Nebraska it arrives at a point many thousand feet nearer the level of the sea than its native home, and where consequently the "conditions of life," as they are called by naturalists, i. e., food-plants, climate, density of the air, temperature, moisture, etc., are very different from those of its native home. Now, it is a general law in organized nature, as has been clearly expounded by Darwin (Origin of Species, chapter I), that changes in the "conditions of life" often operate peculiarly and exclusively upon the generative system, so that an animal or a plant, otherwise apparently healthy, becomes unable to reproduce its species. For example, various kinds of hawks and falcons have been tamed in very large numbers for the last thousand years for the sport of hawking. Their general health does not appear to suffer at all in confinement. Yet, from the changed "conditions of life" to which they are thereby subjected, they almost invariably become barren; and there is scarcely an instance on record of any eagle, falcon, kite, buzzard or hawk having ever bred in a state of domestication, though from the very great price formerly given for the rarer and more highly esteemed species, it must of course have been a pecuniary object to induce them to do so. Experiments in different zoological gardens have led to the same result. Applying these general principles to the case of the hateful grasshopper, we may reasonably expect that the constitution of the insect will be so affected by the great change of climate, air, etc., which it experiences in Kansas and Nebraska, that it will become barren in the autumn of 1867, and consequently that the race will then and there die out. And this theory is confirmed by the fact, that although the people of Minnesota were afflicted by what was probably this same insect in 1856 and 1857, so that "many resolved then to keep two years' supply of produce on hand afterward," yet that after 1857 it totally disappeared there. Indeed, since in the course of the last century or two, many swarms of this insect have probably descended into Kansas and Nebraska from Colorado in different years, if it was physically capable of propagating for an indefinite number of years in those countries, we should in that case have found it there long ago. But this does not appear to have been the case.

For these reasons I do not consider that the hateful grasshopper is at all likely to infest Kansas and Nebraska after the season of 1867, unless fresh swarms should descend upon those countries from Colorado; but that it will, if not artificially checked, terribly infest those countries in the summer of 1867, I have but little doubt. In the words of the prophet, as already quoted—"The land will be as the garden of Eden before them, and behind them a desolate wilderness."

Under these circumstances, and as no plan for destroying the eggs can be effectual, unless it is generally adopted, I should strongly recommend the authorities, in Kansas and Nebraska, to offer a bounty of so much a bushel for grasshopper eggs, on the same principle that bounties are offered in most new states for wolf scalps. This plan has been often tried in European countries, and found to work well. Women and children, who would otherwise be earning nothing, engage in the work;

and after all, though it might perhaps cost the state a few hundred thousand dollars, yet the money does not go out of the state, and the crops of next year will be saved. It is better to feed poor people than to feed grasshoppers, and according to the homely old adage, "a stitch in time saves nine." Without waiting for the legislature to take action, let the county court of each infested county at once offer a suitable bounty, and appoint men at suitable points to receive and measure the eggs and pay for them in county orders. The eggs could probably be utilized by feeding them out to hogs; but this could be easily ascertained by a few experiments. If something of this kind is not done, folks in Kansas and Nebraska had better lay in supplies of provision for two years ahead, wherever the grasshoppers have swarmed this autumn; for in all probability there will be a partial famine in that country in 1867.

I do not think that it is at all probable that these Colorado grasshoppers will ever cross the Mississippi, as the Colorado potato bug has done, and pass onward to the eastern states. In the latter case there were physical obstacles to the eastward spread of the insect previously to the settlement of the Rocky mountain region. But in the case of the Colorado grasshoppers, there was no such obstacle; and as they had not hitherto spread eastward, there is no reason to believe that they will do so hereafter.

B. D. W.

TEXAS FEVER AMONG CATTLE.

Another pest which has made its appearance in the state within the past season is the "Texas fever," "Spanish fever," or "Texas murrain," as it is variously known. This is not a new pest in the state, as the statutes show. There was, however, almost an entire immunity from the disease during the war, when the driving in of Texas cattle was entirely suspended, with the exception, perhaps, of a very few isolated cases, which gave rise to the only cases occurring during the war.

The subject is an interesting one, and one which will demand legislation. The existing law in the case seems to be entirely inadequate for protection, and the people have frequently been obliged to resort to other means.

Mr. William Montgomery, of Stockton, Missouri, writes: "We are at a loss as to how the disease is communicated, as there is no apparent disease among the Texas cattle, but wherever they are herding any length of time, our cattle take some disease similar to dry murrain, and the actions of the animal with the disease are similar to a horse with the botts or colic. They seem to suffer severely with inward fever. When dissected, they appear to be dry and scorched with inward fever. Nearly all that take the disease die, unless treated immediately. Our remedy is to drench them with lard, or slugs of fat bacon. It does not look reasonable that the Texas cattle could communicate disease when they have no disease themselves, but the general opinion is that the disease is communicated by the breath.

"As to an amendment of the laws, we think it would be well to have them so amended as to prohibit Texas cattle from passing through the state, except during the cool season of the year, as we have noticed no disease similar to Texas or Spanish fever, except during warm weather—mostly contracted near ranches and watering places."

Another gentleman of southwest Missouri writes as follows: "I

have lost very heavily this season by the 'Texas fever,' and although it is very strange to me how an animal that is healthy itself can impart so dangerous a disease to other healthy cattle, I am nevertheless satisfied it can be done, as I have lost about one hundred and fifty head by the disease. They show the first symptoms by standing perfectly still in the position that they take to hold back, head down, fore feet thrust a little forward, ears dropped down, and are neither hungry nor thirsty. Their bowels become very costive; in fact, it seems as if their intestines became entirely dry, and unless an operation can be obtained, they die. Our most successful mode of treatment was to make them swallow a piece of fat meat (bacon), and force another one up their posterior (rectum) with the arm, as large as admissable and as far as possible. We saved about sixty after we adopted this mode of treatment, but the hair came off in spots from one to five inches in diameter. I doubt whether it can be cured in every case. I have heard a great many theories about it, but I understand you want facts, and I have written them.

"There is another fact that cannot be gainsaid; that is, since 1861 there has not been a single case of Texas fever in southwest Missouri, neither has there been any Texas cattle. Until the past spring and summer we have had Texas cattle and Texas fever. I have been dealing in cattle all the time since 1861, and in the time did not lose a brute until the past summer; so I say it is the southern cattle, and they ought not to be allowed to enter the state from the 15th of April to the 1st of October. Kansas learned this, and has legislated accordingly."

Mr. Huron Burt, of Williamsburg, Callaway county, says: "We have had some experience with the disease on the Nine Mile Prairie. Last spring, early in April, a lot of oxen passed through our county on their way west for some overland freighters, that had been shipped from New Orleans to St. Louis. The grass was just starting forth, and the cattle were occasionally stopped to bite at it. Wherever they grazed the virus of the disease was left, and all cattle that fed on the same ground on which the Texas oxen grazed were afflicted with the disease—nine-tenths of all the cattle affected dying.

"The disease was communicated for several months—in fact, during the whole season, until the unusually heavy rains in September, which seemed to have washed away the seeds of the disease that had been so fatally implanted all along their route. It was necessary for an animal to feed on the self-same ground to contract the disease—those feeding up to the very verge of the poisoned ground, with only a fence intervening, were unharmed; and I am further informed that the disease is only communicable from Texas cattle—stock feeding after our home cattle that are diseased escape unaffected.

"This has proven to be the most fatal cattle disease, and the most destructive to the stock growing interest, ever known in Callaway.

Captain Hobson lost all his cattle, some fifteen or twenty in number, save one. His son lost all of his. Mr. Everhart lost several, among the number a fine bull, which is a loss indeed; animals of this character being quite scarce in our section. Mr. Joseph Grant lost some valuable cattle, besides others that do not occur to me at this moment. If the intervention of law was ever required in any case for the protection of stock growers, it is in this instance, and I am heartily glad to see the movements made in this direction. Four and a half or five months should be the extreme limit allowed for passing this kind of stock through our state, and I am not sure but a shorter limit would be justifiable, say from November 15 to March 15."

The following communication from Dr. Albert Badger, of Vernon county, Missouri, gives the most full account of the disease that we have been able to obtain:

THE SPANISH OR TEXAS FEVER.

The Spanish or Texas fever is well known to the older residents of this county.

This disease was first recognized as having been propagated by cattle driven from Texas some twelve or thirteen years ago; the disease having been in the county some two seasons previous to its having been traced to the Texas cattle.

From the first breaking out of this fever it was found to be confined to the large roads or highways running through the county from south to north, and, finally, was centered on the Texas cattle, I believe. in the year 1853, by its being confined to one highway through the county over which these cattle passed in that year. On this road the disease was quite fatal, killing about fifty per cent. of all the cattle on the road, and persons living near the water courses over which the road crossed lost as high as ninety per cent. Captain Freeman Barrows and Peter Colley, the one living at the ford of the Osage river, the other near by, lost the latter per cent.—one of them owning about one hundred head, while the former had considerably above that number, Mr. Collins, living at the ford of Clear creek, south of the above, lost an equal proportion.

The disease being in no other part of the county that year, satisfied the people, on this road at least, that they had found the true origin as it had been among the cattle in the country for two summers past. In a season or two after, almost every settler of the county was convinced that the Texas cattle in some way communicated this fever to our stock, although a few persons living secluded from the great highways were unbelievers, and still remain so. In fact, the way this disease is propagated, the obscurity surrounding it for want of a defined cause, together with the different conflicting opinions of almost every citizen familiar with it, gives them at least a reasonable excuse for believing no one's opinion. Two things only, the symptoms

of the fever and its fatality, are agreed to by every one, the latter being much greater in a warm dry summer than in a cold wet one; the disease always ceasing when the frosts and freezes have killed the vegetation.

The first symptoms of the fever discoverable several days before there is any appearance of the sickness, is a dry cough which is noticeable by careful observers, in a few days after this the nose becomes dry and the ears slightly drooping, when more flies will be found to collect on this than the other cattle. At this stage the breath will be found to have lost its sweetness so peculiar to grazing cattle, and assumed the sickening feverish smell, generally if not always found in the Texas cattle, which I can best describe by comparing it to the smell of our slaughterhouses or constantly crowded stockyards in cities. From this condition, in one or two days the fever gains its highest stage, and is found to have disseminated itself over the whole body, the heat being very great, and the arteries of the neck are seen to beat in short, heavy throbs, and the ears very much lopped; the hinder parts reel in walking, the animal getting up or lying down with difficulty; the breath and exhalations are very disagreeable; the end of the tail usually hollow for two or three inches; the pith in the horns has commenced to decay, if not already decayed; the animal refusing to notice the herd, remaining stupid if not disturbed, neither seeking food nor water. Some in this stage will pass water mixed with blood and dung naturally, others will pass water of a natural color and not dung at all, or but very little, and that in a dryish lump. In another type of the disease, which will occur perhaps in every eighth or tenth case, after being taken the same way and having the same symptoms as those described, even to the hollow horns and tail, the animal does not get weak, sluggish or stupid, but is always to be found on its feet, in a watchful attitude, with head turning to any noise which, if close by it rushes toward, even through fences or against trees, the eyes being of a green cast, very glaring and wild; those of the first type have a dead, sleepy and glazed appearance. Both these classes die, as I have described them, without any change, except their hair deadens before death, and has the appearance of that on a dry hide.

The drove mentioned as having passed through the county in 1853, was owned by Mr. Richard Burriss, of Spring river. They were driven from Texas the fall previous, and wintered about fifty miles south of here, near Sarcoxie. In the first days of June Mr. Burriss came into this county with his cattle, apparently healthy, in good order and no lame ones in the drove, numbering about 450 head. He made a slow passage through the county, grazing on the best grasses near the road unmolested, as no one knew at this time that this species o cattle propagated a disease to ours. In the first days of July the fever broke out on the road traveled by this drove, lasting until the frost put a stop to it, with the fatality previously mentioned. As the disease this year was in no other locality except where these cattle were

driven and grazed, the citizens, after carefully tracing their route through the county in all their windings, came to the conclusion for the first time, that this fever was engendered from the Texas cattle. This was verified most fully in the next year; and up to the outbreak of the war, hundreds of circumstances have occurred in proof that they were not mistaken.

No Texas cattle, until this year, have been passed into or through this county since the year 1860, except two yoke of oxen in the fall of 1865, worked here by Mrs. Box; neither has there been a single case of fever during this period, or any fatality among our cattle. Mrs. Box's oxen, so far as could be seen, were healthy, and not lame. The neighbors whose cattle came in contact with these oxen, were Mrs. Smalley, Mr. Cothran, and Mr. Packard, each having the Spanish fever among their stock, losing some, notwithstanding the lateness of the season.

About three thousand head of Texas cattle passed through this county in the month of June of this year, and a portion of them reached six or eight miles into the adjoining county of Bates, before being turned back by citizens of that county. They returned on the same road previously traveled, making no delay in their passage either way more than was necessary. The disease did not break out for some six weeks or two months after the passage of the droves, many more recovering from it than usual—and about forty per cent. dying—extending into Bates county to the point where they were turned back. It proved more fatal on the crossings of water courses, killing about seventy per cent.

In 1858, my stock were exposed to this fever by coming in contact with a drove of Texas cattle. The fever was very bad among them, one or two dying every day through the month of August; they were in daily contact with Mr. Millender's stock, who kept a herder, not suffering them to reach the grounds that had been used by the Texas droves, yet he had not a single case of fever. When spoken to about keeping my stock from coming in contact with his, he told me there was no danger of our own cattle diseasing one another. I have since watched many such exposures, and in no case has the fever been propagated.

The farmers have each an opinion as to how the disease was propagated to their cattle, some thinking it is through the lame ones, a few of which will be found in nearly every drove coming from Texas. Their feet become worn out and sore from long travel, matter forms between the hoofs, and is left on the ground and in the water through which they pass, and it is contended this inoculates our cattle by being taken into the stomach or otherwise. Others think it is done by the excrements left by those that are lame, or the diseased ones—while some think it is through the slobber or froth which is left on the grass. On one thing they agree: that the fever is propagated in some way, raging until the cold weather puts a stop to it, no remedy

appearing to have any effect. From the few cases mentioned which are selected from many of like nature, I have been led to believe, first, that the disease is conveyed to our cattle by those from Texas; second, that the feeding of a large herd one winter in this climate does not stop the spread of the infection from them in the next season; third, that Texas cattle in apparent good health give disease to ours; fourth, that the disease is not contagious from our own cattle to each other; fifth, that killing frosts will stop the disease; sixth, that no remedy has been found to cure this fever.

In a very close observation of this disease among my own and neighbors' stock for the last thirteen years, I have generally found on opening those that had died but very little blood, and the following results: those that passed water mixed with blood, the kidneys and surrounding parts were entirely decayed, the other parts of the body sound; those that did not dung at all, or but very little, with manifolds perfectly dry and partly decayed, while the large stomach would be more or less mortified—other parts healthy; those that appeared to dung and pass water naturally, with a liver more or less decayed, the gall always swelled to its greatest tension—other parts healthy; those that were ever on their feet, in a watchful attitude—the brain was found more or less decayed. This leads me to believe the disease to be in the blood, which finally becomes congestive, destroying the parts in a few hours after it becomes seated, and no doubt in many cases could be cured if we knew exactly when and where it had located itself—blood-letting not being sufficient of itself to check the inflamation. The hollow horn and tail no doubt is caused by the fever destroying the blood in the extremities before it does in the vessels, which it does in a great measure before death.

This county has suffered very severely with this disease for a number of years, losing in the year 1858 cattle estimated to the value of over one hundred thousand dollars. The present law is very defective for keeping out the disease. First, it only precludes the sick ones from a passage through the country, and few men under oath, can say that because a steer has an unhealthy smell that he is sick, when apparently he is in as good health as their own cattle; secondly, in order to separate the lame or sick ones, if any, the drovers under our present law are required to impound them in order that the selection may be made. How is it possible to impound from ten to seventy thousand head of cattle, when the owner has not a single pound, and no means of getting one? If a farm was bought for this purpose, the country for miles around would be overrun and eat out by these cattle waiting their turns for examination, thereby destroying every head of stock in that and the immediate locality; in fact, why select the sick ones, when there is equal danger in those that are apparently well?

One thing is certain, this part of Missouri, one of the best counties in the state for raising stock, must quit the business, or our laws must

protect us. This can be done either by so changing them as to preclude this species of stock entirely, or let this state buy a right of way from some point on the railroad to the northern border of Arkansas or the Indian territory, running as much as possible through our prairies. This will not interfere with citizens. Tax each head of stock driven over this road one or two dollars until the road is paid for; the drovers will readily pay this sum, which no doubt will pay for it in two or three years. I was informed, this year, that there was seventy thousand head of these cattle between this county and Neosho, a distance of not more than one hundred miles, and that many more would be driven next year, if they succeeded in getting through this. By this means a great outlet would be furnished Texas for the surplus stock, and St. Louis would also be the gainer. This would seem to be better than a law excluding them; and further, this great highway, honestly conducted, would in a short time be a great scource of revenue to the state. The drovers this winter, on the meeting of the Legislature, will spare neither time nor money to abolish the present laws, or getting relief in some other way. I propose for their consideration this road—without it they must give up their occupations, or we must ours.

Respectfully,

ALBERT BADGER.

NEVADA CITY, VERNON CO., MO.

Reports have reached us of the ravages of Texas fever from Kansas, Tennessee, Kentucky and Illinois. The losses from it have been heavy; in some instances very choice and valuabe stock has been lost.

Western states have been severely censured in some quarters for passing laws to prevent the introduction of this disease, attributing to us selfish motives, namely: the prevention of the competition of southern cattle in our markets. It will be seen by reference to the opinions already given of farmers of southwest Missouri, a locality that has suffered, probably, more than any other, that no such selfish motive is apparent. They propose that the Texas cattle shall be prevented from being driven into the State during the warm season, when the fever is so readily communicated, but to be allowed unrestricted passage during the cold weather, when the disease seems not to be readily communicated. Dr. Badger proposes that the state shall purchase a right of way from the southern line of the state to the Pacific railroad, on which Texas cattle may be driven at all times.

As before remarked, the subject has become one of urgent importance, and the legislature will be called upon to enact laws in the premises which will protect the interest of the state and the welfare of its inhabitants. A law entirely prohibitory, we think, will be the only effectual method of keeping the disease out of the state. If southern cattle are allowed to be driven into or through the state at

all, it will be almost impossible to prevent more or less loss of our stock from the pestilence which they carry. Again, we think they should be kept out of our markets, as a wise sanitary measure. It can scarcely be possible, certainly is not probable, that cattle carrying an infection of so virulent a character can constitute wholesome human food. Who would knowingly eat the beef of cattle with such a pestiferous breath as these Texas cattle seem to have? It can be no favor to the consumers of beef to have that article cheapened in the market by the introduction of an article of such very doubtful, not to say positively injurious, character. We should keep out the Texas cattle on the same principle that we would the small pox or the cholera. They are pestilential. Who could complain or who would suffer from such a law? Chiefly, it would be the drovers and speculators in this stock, who care more for filling their own pockets than for the losses of others or the health of the community.

Notwithstanding the vicissitudes and the pests referred to, the year has been one of prosperity on the farm, owing, in part, to the high prices obtained for farm produce of every kind, and in part to increased economy in the modes of production.

The board of agriculture has cause for congratulation upon the fact that the general condition of agriculture was never so promising in the state as at present. In nearly, if not quite every county which has been heard from, there is evidence of new life and enterprise among all classes. One of the most important features, as evidence of progress in the right direction, is the fact that in nearly every section of the state manufactories have been springing up within the past year.

No one thing is of more importance to the prosperity of Missouri, probably, than manufacturing. Our facilities for it are scarcely surpassed. In some portions we have superior and abundant water power; in others, immense coal beds. Steam power has been found quite as economical for manufacturing, and in some cases more so, than water power. Farmers will be largely benefited by the more general introduction of manufacturing. It will afford them a home market and better prices for their crops, while it will enable them to purchase their supplies of manufactured goods at lower prices. It will enable them to grow a greater variety of crops. Some of the most profitable crops cannot be grown to advantage for a distant market, and a greater variety of crops tends to preserve the fertility of the soil by affording better rotation. Again, if the products of the soil are consumed near where they are grown, manures and fertilizers are more readily returned to the soil, which will be of vast importance in course of time.

Farmers have given unusual attention to improved methods of

cultivation and to the cultivation of new crops. A marked disposition has been shown in every locality to secure improvement in stock, and a large amount has been brought into the state of the various improved varieties. Immigration to almost all sections of our domain has been large, and of a class which has given a decided impetus to our agricultural and manufacturing interests. The indications are that the immigration will be largely increased another year.

Since it has become known abroad that a state agricultural report was issued a year ago, numerous applications have been received for copies of it, from persons in eastern states, who were thinking of locating here, and were anxious to get information in regard to the agricultural character of the different parts of the state.

The farmers of Missouri have apparently been well pleased with the first report, much more so in fact, than was expected. Applications for copies have been numerous, and correspondents have spoken of the work in terms of praise certainly quite equal to its merits.

During the past year there has been manifested a very much greater willingness on the part of farmers in various parts of the state in responding to inquiries, and in furnishing the board with desired information. The names of many such will appear in this report. They are deserving of the hearty thanks, not only of the board, but of the people of the whole state, and a more substantial reward. Many of the correspondents of the board are new citizens of the state.

FRUIT GROWING.

Among the various branches of farming none has received a greater degree of increased attention than fruit growing. With scarcely more than a single exception, every county heard from gives evidence or report that fruit growing is rapidly on the increase, in some cases amounting almost to a mania. This can only be regarded as one of the best evidences of an advanced condition of agriculture—of a more intelligent style of farming. It may safely be considered, when the people begin to give thorough attention to fruit culture, that the pioneer style of farming is passing away. Health is of first importance, and the great value of an adequate supply of the various varieties of fruit in their season for family use, has been greatly overlooked in nearly all localities. Our fruits contain a large proportion of sugar, mucilage, etc., in such desirable combination with vegetable acids, extractive matters and aromatic principles as to form nutritive matter of great value, rendering them capable of acting powerfully as refrigerants, tonics and antiseptics, and when freely used at the season of ripeness, by laborers and others, they prevent debility, strengthen digestion, correct the putrefactive tendency of animal or nitrogenous food, avert scurvy, bilious diseases, and, no doubt, maintain and strengthen the ability for productive labor.

Fruit growing for market, where a good market is convenient, is much the most profitable of any branch of farming, as well as the most interesting.

We feel constrained to caution fruit planters in a few particulars. There has been, and still is, as we think, far too much of a disposition to plant dwarf pear trees in preference to standards. Quince roots are more fibrous, and do not reach as far for nutriment as pear roots. They are, therefore, only well suited to certain soils, such as are deep, rich, moist and loamy. The dwarf pear, in addition to a soil well adapted to its wants, requires thorough cultivation, and a degree of skill and care in its treatment that nine-tenths of the planters will not give it. Even where all the circumstances seem to be favorable, it has often proved shortlived, and very liable to be blown over by winds and broken off at the junction of the pear with the quince root. For these various reasons it has too generally been unsatisfactory in this region. On the clay soils of our state, especially the post oak and white oak soils of the hills, the standard pear does well, bears about as early as a dwarf, and gives much better general satisfaction. The Duchesse de Angouleme and Louise Bonne de Jersey may, perhaps, be better grown as dwarf than as standards, but it is, to say the least, very doubtful whether any other variety dwarfed can be recommended for general planting.

Another important matter is to select such varieties of fruit as are known to be adapted to the locality. Farmers have been too ready to purchase such varieties of fruit as have been recommended to be first rate by some tree-peddler or agent of some far distant nursery, especially with the convincing proof of a very tempting picture. Some varieties of the apple that are first rate in New York state are nearly worthless here. It requires time and experience to determine the adaptation of varieties to different soils and latitudes. The transactions of the state horticultural society, published annually in the agricultural report, will afford much valuable information on the subject, especially valuable to "new comers."

GRAPE GROWING.

This branch of fruit culture is certainly increasing in a remarkable degree in nearly all sections of the state. In some localities there is quite a mania for grape planting. It is destined to become one of the most important interests of the state. Grape culture has, within the last two or three years, increased immensely in Jefferson county, which seems likely to prove one of the best localities for the grape in the state. In fact, in every locality heard from, where grape culture had been begun, it has been largely extended within the past year.

In the early part of last summer the Bluffton wine company was organized, with an authorized capital of $150,000, about $100,000 of which has been subscribed. The company has purchased about six-

teen hundred acres of land, mostly in Montgomery county, a portion in Callaway, on the north bank of the Missouri river. These lands are on high magnesian limestone bluffs, where a large number of varieties of the grape have been remarkably successful for the last three years. The company has erected extensive propagating houses, at a cost of about $15,000, capable of turning out 300,000 plants per year. It is contemplated to build a large wine cellar, probably next summer. The operations of this company, if carried out as designed, are likely to exert an important influence on the progress of grape culture in the state. Already several similar companies are talked of or are projected. The following is the report of the president of the Bluffton company, made in December:

FIRST ANNUAL REPORT.

At this, our first annual meeting, allow me to congratulate you upon the flattering success which, after an existence of hardly six months, has already attended our labors, and which I hope will be the forerunner of a long career of usefulness and prosperity.

Several years ago, already at a time when grape growing first became a hobby and a passion with me, the idea of forming a company for that purpose, in one of the many favorable locations which our state possesses, struck me as not alone feasible, but highly advantageous. "In union is strength," is an adage the truth of which we see daily illustrated. Why then should it not be true of grape growing, perhaps the most social calling on the face of this globe? But the late unhappy war, with its distractions and strife, was a time but poorly calculated to foster and further the vine dresser's peaceful avocation, and the project was laid aside, not abandoned. And when peace with its blessings returned; when the husbandman sought again the forsaken homestead, and thousands of willing hands were willing to turn their swords into pruning hooks, the time seemed propitious of all others to unite in an effort of the kind. And surely "there is a divinity which shapes our ends." About this time, my attention was called by Dr. Hyde to the superior adaptability to grape growing of the bluffs on the north side of the Missouri river, commencing a few miles above the mouth of the Gasconade river, and extending to Portland. I thought I saw in the advantage, this locality offered, of the most superior grape lands, which were at the same time easy of access and could be bought at very low figures, the foundation of one of the grandest successes of the kind; and a few friends to whom I mentioned the idea, thought so favorably of the project that the necessary steps were at once taken to organize a company for the purpose, with whose objects you are all familiar.

And now it becomes my pleasant duty to report to you a progress which, considering the short time of our existence, and the many difficulties we had to encounter, is certainly most cheering. We have disposed of over nine hundred shares of the stock. Our stockholders comprise men of all classes, from the sturdy laborer up to those occupying the highest positions, a list of names of whom we may be justly proud, because they are from the very bone and marrow of society; and which are the best guarantee, to the public as well as ourselves, that our undertaking is one which has the sympathy and confidence of the people. We have secured one thousand six hundred acres of land, with over two and one quarter miles of river front, comprising several desirable farms and splendid steamboat landings, only a mile and a half from Morrison station on the Pacific railroad, and with seven acres of vineyard, of which three are in full bearing, already planted, for little more than $27,000 or $17 00 per acre. Our propagating houses, the largest west of the Alleghanies, with a capacity for turning out over three hundred thousand plants a year, and which will cost about $15,000, are nearly finished; we have four tenants on the premises already, and many more have offered and are ready to take a lease, as soon as we can furnish them with houses to live in. We have been fortunate enough to secure the services of two of the most efficient men who could be found in this country, Mr. Samuel Miller, of Lebanon, Pennsylvania, whose name is already well known as a successful and enthusiastic grape culturist, as manager of the vineyard department; and Mr. Charles Peterson as manager of the propagating department, whose splendid success in raising the finest plants I ever saw, while in my employ last summer, has satisfied me and all those who have seen the vines he raised, that he is intimately acquainted with all the details of propagating, and will grow only such plants as the Bluffton wine company may be proud to send out, and

willing to own. We have secured the whole stock of Mr. Miller, comprising one of the most valuable collections of grapes in the country, at very low figures; these, together with many valuable varieties I had, will perhaps make the largest and most valuable collection of grapes on this continent. The necessary grape wood for propagating has been secured in time, and at very low figures; we can therefore confidently expect to grow an immense number of vines the next summer, the sale of which will yield us large and immediate returns. We can make a crop of grapes from three acres of vineyard of the most reliable and approved varieties next season, and so at once commence to make our own wines, which I hope will establish a claim for the superiority of the Bluffton wines. We have a splended site for a grape-grower's village, which for healthfulness of location and beauty of scenery can hardly be surpassed by any in the state, and which may in time become a pleasant summer resort from the heat and bustle of the city. Mr. Meyer, the owner of the land between Morrison station and the river, has, with commendable public spirit, offered us the right of way from the station to the river; and thus the place will be easy of access in summer, either by railroad or river. Our call of thirty per cent. of the capital has been readily responded to by nearly all of the stockholders, and although our expenses have necessarily been very heavy, yet the report of our worthy treasurer, to which I would here refer, shows our money affairs in a very satisfactory light.

And this, gentlemen, has been done in six short months, accomplished against many obstacles, among which not the smallest was the distrust among the public against similar enterprises, which had either failed or "drag their slow length along" without profit or satisfaction to their stockholders, without benefit to the public, or the cause it was their aim to further. But we have one all-important advantage over them. Ours is a "mutual interest enterprise." Every one, from the tenant up to the manager of the different departments, has his own interest at stake, has a share in the results, and it is this one great principle which I consider the best guarantee of our success. That man will work with greater courage, with more zeal, who knows that he will enjoy the fruits of his own labor; he is a different being altogether than the hired laborer, who works for so much per day, however faithful he may be, and it is but natural that it should be so.

Another great obstacle was the prevailing disease, which has called so many of our best citizens to their last home; men who would have gladly and willingly helped in our work. Men did not feel like embarking in new enterprises, however promising, when they did not know how long they might be permitted to enjoy what they already had.

But our progress is all the more satisfactory because we had these obstacles to overcome. And here it becomes my pleasing duty to say that but for the hearty co-operation of every one of the officers with whom I had the pleasure of being associated, this would never have been attained. I have found them ever willing to sacrifice time, and often personal comfort, to further the enterprise, with a readiness which showed that their heart was in it, and that they were emphatically "the men for the place." With such assistance labor becomes a pleasure, and I cannot forego the opportunity of expressing to them my sincere thanks for their friendly and harmonious co-operation, without which it would have been impossible to succeed.

But although much has already been accomplished, a good deal remains to be done. I would recommend to your special consideration and adoption the following measures:

1st. To appoint an assistant secretary and bookkeeper, to reside on the grounds, whose business it shall be to keep all accounts, make out bills, answer correspondence connected with the sales, and transact such other business as may properly belong to his sphere.

2d. To survey the land and lay it off into lots of twenty acres for the occupation of tenants.

3d. To build suitable houses for the managers, and also for the accommodation of visitors.

4th. To plant and cultivate an experimental vineyard, where all new and promising varieties of grapes may be tested; an institution which will be of incalculable benefit to the state at large as well as to ourselves.

5th. To lay out a village, to form a nucleus and trading post for the settlement as well as for the surrounding country.

6th. To establish a ferry and postoffice.

7th. To build a bridge across Bailey's creek, at Morrison station.

I would also recommend that the most liberal encouragement be given to any party who would build a sawmill on the place, as this is almost a necessity. The company has timber enough on the lands which is easy of access, and thus most of the building materials which must now be bought at very high figures and transported at very high cost, could be sawed on the ground at a very great saving to the company. We will have to advertise largely and send out traveling agents during the next year, to help to dispose of our vines. To raise the first necessary funds several of us have made loans, and pledged their individual credit, which obligations should of course be promptly

met. A cellar should, if possible, be built next summer, as well to receive the wine we make as also the produce of the surrounding vineyards, of which there are already several, thus at once establishing a market for all the produce in the neighborhood. To accomplish all this we shall want, including the money already expended, the sum of $60,000; to raise this amount we should sell in all about 1,200 shares, and another call of twenty per cent. will soon become necessary. It is true, we expect to make this amount from the sale of plants, etc., but it will be a year from now, at least, before we can expect any receipts. And it is for this, gentlemen, that I would ask your hearty and active support and co-operation. Either of you can do his share in his particular sphere, to further the enterprise by asking others to participate, by helping to dispose of our produce, by promptly and cheerfully furnishing the means; and it is only by such heartfelt and universal interest, which each of the stockholders should take in the success of the enterprise, that we can hope to make it what it should be, a nucleus of the grape-growing interest of that region, and a stepping-stone to many who now eat the bitter bread of dependence and poverty, to independence and wealth. And you can boldly and confidently invite the participation of others. Ours is no humbug concern, no uncertain oil speculation, which offers only a bare probability of success. The land we have bought is worth double the price we paid for it to-day, and would alone give ample security for all the capital invested in the enterprise. This tenant system is no new, untried experiment; one of our stockholders himself, commenced as my tenant, under the same conditions, five years ago, with hardly ten dollars he could call his own. Now he is independent, nay even wealthy; and voluntarily signed ten shares because he has faith in the system, because he knows what he has achieved under it; and although he purchased a place of his own, he preferred to lease it to his brother, under similar conditions, and remain on mine. These are facts which speak louder than all surmises which could be made, for the certain success of an enterprise founded on the same system, if properly conducted.

In conclusion, I heartily thank you for the honor conferred upon me by again electing me president of an institution which, I sincerely hope, will yet be a source of pride, gratification and profit to every one who has lent a helping hand to establish it, as well as a credit to our beloved state, one of whose leading interests it is calculated to further and develop.

GEORGE HUSMANN, *President.*

SORGHUM AND IMPHEE.

The culture of the Chinese and African sugar canes has not received the attention in Missouri that it has in several of the neighboring western states. In Illinois and Iowa, especially, these canes have become a very important crop. In many counties of these states thousands of barrels of good sirup are annually made.

In Missouri the Chinese and African canes, most of the varieties, have been introduced in nearly every locality, and sirup of good quality made, sometimes even by very rude machinery. Enough has been done to show that our soils are admirably well adapted to the crop, and that when it receives the attention which it deserves, it will become one of our staple productions.

It is believed that sorghum ought to be more largely cultivated in our state, and that wooden crushers, pans and kettles ought to give place more generally to better and more perfect implements. Where an individual farmer is not so situated that he can provide himself with the best machinery for manufacturing the cane, let him combine with his neighbors for the purpose. Let several agree to raise a number of acres of cane; let one of the number, who is best situated to do it, purchase the best machinery for working it up, and let him manufacture the crops of the others for a share. This is the course most commonly followed where the cane is largely grown.

There are several quite successful examples of sugar-making from

these canes, and there is scarcely room for doubt that sufficient experience will soon be gained, if it has not been already, to render the production of sugar entirely successful and profitable. Farmers have been humbugged to such a degree by patent receipts and nostrums for making sugar from sorghum, that they have become considerably disgusted with the subject. It is scarcely probable that any nostrum or chemical action will enable us to make sugar from sorghum juice, under any and all circumstances. The facts so far indicate that, for making sugar, main reliance must be placed upon selecting the right soil, upon cutting at the right time, and proper handling afterward. Opinions are conflicting in regard to choice of varieties, but the majority of the evidence seems in favor of the African varieties for sugar.

The following, from the Sorgo Journal, probably gives the best and latest information in regard to sugar making from northern cane:

SUGAR MAKING.

It is, we think, well enough understood, by all intelligent operators, that the production of sugar from sorghum is not to be accomplished by any magical or sleight of hand process. It is a regular business undertaking, and, like all business enterprises, will succeed or fail accordingly as the conditions upon which success depends are complied with or neglected. Crystallized cane sugar is a delicate substance. The work of producing it from cane, or any of its natural sources, is attended with many difficulties and is subject to many contingencies. Sugar frequently occurs in sirup without any particular effort on the part of the operator, and sometime quite unexpectedly; but this does not prove that it is a haphazard operation, or an accidental occurrence, as likely to take place under one set of conditions as another. Crystallized sugar never occurs by accident any more than cane-stalks spring up and grow by accident. Its production is governed by law, or laws, as fixed and unchangeable as those which control the revolution of the earth and cause the sun to rise.

The laws or conditions under which sugar is produced, relate to every step in the operation, from the selection of the seed and the soil down to the final act of graining. A failure to comply with the law at any step in the process, will entail a corresponding failure, either partial or complete, in the final result.

Many persons will undertake to produce sugar from their cane this year, and we have no doubt a much larger quantity will be made than ever before. It is now too late to repair any mistakes that may have been made in selecting seed or soil, or in any of the preliminary steps of the operation. The cane is grown, and the operator must take it as he finds it—be it sugar or sirup, or neither. We propose to give a few general directions relating to the work yet to be performed, for the benefit of those who wish to make a systematic effort for sugar. We begin with a word upon the

Best Variety of Cane for Sugar.—It is generally admitted that the Oom-see-a-na (by some called Otaheitan) cane is most productive of crystallizable sugar. Those who have this variety, will do well to make their special effort for sugar upon this; though it is by no means certain that other varieties will not granulate. We have great hopes that the Liberian will prove as good for sugar as the Oom-see-a-na, and we earnestly advise those who can conveniently test this cane for sugar to do so. The Nee-az-a-na, or white imphee, shows quite a tendency to grain. The "regular sorgo," or Chinese cane, has been supposed to be less productive of sugar than the imphees, and some have formerly contended that no crystallized sugar could be produced from it. But sorgo sirup granulated last year in many instances, and it would not be surprising if it should, after a few more years of cultivation in our latitudes, turn out to be as productive of sugar as any other variety. We would not counsel any operator, who has only sorgo cane, to forego an effort for sugar, if he wants to try his hand at the business.

Time and Mode of Harvesting.—Until recently, the opinion has prevailed that cane for making sugar should be thoroughly ripe—that it could not remain standing in the field too long, provided it escaped frost; but lately this notion has been considerably modified. Numerous instances have occurred in which early harvested cane has afforded sugar, while portions of the same field,

left standing until later in the season, gave no signs of crystallizing. We do not consider the theory of early, or we may say premature harvesting, as fully made out; but we do think the indications point in that direction, and we advise operators, who contemplate an experiment for sugar, to begin early, and note carefully the results, along from the first to the latest cut cane. It will not be amiss to commence in a small way very early, say as soon as the cane turns sweet, when it begins to flower; though we think the most appropriate period will be found just after the seeds begin to form, and before they commence to harden.

In cutting cane for sugar, select stalks of uniform state of maturity, leaving all others to be worked for sirup. One of the greatest obstacles to success in sugar making, has been the indiscriminate mixing of all kinds of cane in the operation. If sirup of half the stalks is crystallizable, and the other half uncrystallizable, the latter will delay, and perhaps entirely prevent, the sugar of the first from crystallizing out. If sugar is worth an effort, let it be a whole effort, not a halfway performance. For the same reason, reject the two top joints below the arrow; also, two or three joints at the butt. In harvesting the cane, cut it up close to the ground, without removing leaves or panicle; throw the stalks designed for sugar in a pile separate from those which are to be rejected; haul to the mill with as little delay as possible, and then strip and trim the stalks only as fast as they are ground, and grind as soon as possible after the cane is cut and prepared.

GRINDING.—Not much to be said under this head. Have the mill and all the vessels which are to contain the juice perfectly sweet and clean. The first step in fermentation, and long before the fermentive change becomes apparent, is the conversion of crystallizable to uncrystallizable sugar; and this is excited in cane juice by the presence of fragments of old bagasse or a few drops of fermenting juice, as speedily and much in the same way that milk is changed when put into unwashed pans which had contained sour milk. Crystallizable sugar contained in cane juice, may be entirely converted to uncrystallizable in an hour's time in a warm day, if an active excitent like sour juice is present in it; and it don't take much to do the business. Notice how soon bread "rises" after being kneaded with a little yeast; and remember that the yeast first acts upon the cane sugar in the flour, and upon a portion of starch, converting them to grape sugar before the apparent fermentation, the development of carbonic acid, which causes the rising, begins.

TEMPERING JUICE.—We do not like to say much about lime. It is objectionable in the juice of sorghum canes; but there seems to be a necessity for using some sort of neutralizer, particularly when working for sugar, and lime is decidedly the best alkali that can be used. We would employ a very little lime, adding it to the juice the last thing before it goes to the pans. The best way to use lime is to mix it up thin, about to the consistency of milk, and stir it well into the juice. No one should attempt to use lime without litmus paper, to determine when enough has been added, as an access is worse a good deal than none. Use only enough lime to show, by the change in the color of the litmus, that an effect has been produced. It is not safe to produce complete neutralization.

EVAPORATION.—This is the most important part of the whole operation of sugar making. Hundreds of tons of sorghum sugar are made, every year, up to the point of evaporation, and here it is all, or in a great proportion, decomposed—converted into uncrystallized glucose, and practically sacrificed. True, sugar is nearly always developed to a greater or less extent in our canes, and it is often preserved intact through all the subsequent operations of harvesting, hauling, storing and grinding; and it is contained in the juice as it enters the evaporator, but that is the end of it. The sugar goes into the evaporator, but in the great majority of cases it is not true sugar, but something else which comes out. Heat is a destructive agent. Dense solutions of sugar exposed to boiling heat are always acted upon and converted, to a greater or less extent, to glucose, and always in proportion to the density of the solution, the time of exposure and the quantity of acids and other foreign matters present. The reason why vacuum pans, which are immensely expensive, are employed in boiling sugar, is because the excess of water is vaporised and expelled at low temperature, and conversion of sugar is thereby avoided. The refrigerating process, and the numerous processes of desiccating or drying away the excess of water, are employed for the same reason. The notion that sugar is converted to glucose by heat, is not a new idea, developed by our sorghum practice. It has always been known, and it is the great obstacle to success in all sugar-making operations, with tropical canes, sugar beets, and everything else which is worked for sugar.

In our domestic operations we cannot employ vacuum pans which boil at low temperatures, and which, on that account, afford the most appropriate means ever devised for evaporating cane juice. We must use something else, and we should endeavor to find these means which will come nearest to affording all the advantages secured by the vacuum pan. This apparatus effects its object by reducing the temperature of boiling. The nearest we can come to effecting the same object, is by reducing the time of boiling. This is practicable, and when carried out to the point of greatest attainable brevity, the results are almost as good as would be produced by evaporating our juice in

vacuo. The importance of concentrating rapidly, and in small quantities at a time, so as to abridge time of exposure to heat, is so great, when working for sugar, that, if we were called upon to give a dozen rules for conducting the operation of boiling, we would give this one a dozen times, regarding everything else as comparatively unimportant.

Boiling by steam is not appropriate for sugar. The operation must necessarily be conducted upon considerable quantities of juice or sirup at a time—enough to cover, or nearly cover, the pipes—and this will not do. No matter how complete and convenient the apparatus, the time of exposure of the dense solution to boiling heat, in the last stages, must, in the nature of the case, be so long that the crystallizable sugar will undergo conversion. A few persons have flat-bottom pans, heated by steam. These are good, if strong enough to sustain a pressure which will give active ebullition.

To those who evaporate or finish their sirup in strikes or batches, there is but one word of advice to give. Make the batches as small as possible. If they are not small, do not expect any sugar. You may make passable sirup of juice that remains exposed to the fire an hour, or an hour and a half, but you can not produce sugar. Persons who use Cook's continuous pan should remember that all that is said with reference to boiling with a shallow stream for bright sirup, applies with immensely more force when sugar is contemplated. This apparatus affords facilities for boiling and concentrating juice to sirup, with a briefer exposure to heat than any evaporator ever made; and on this account it has been, and must always be, the best and most successful sugar evaporator—that is, until something is discovered which will concentrate with a still more brief exposure.

With regard to defecation, it is not worth while to say a word, so far as relates to sugar. It is of no importance whatever compared with the other matter to which we have referred. Remove the scum and impurities, as well as the evaporator, and the conditions under which evaporation is conducted will permit, and let the rest go. Dirt does not crystallize, and it does not impede crystallization much. If all the green and feculent matter contained in the juice were retained in the sirup, it would not be so bad, or so much of an obstacle to sugar, as exposure of juice to boiling heat for a half hour more than necessary. We do not now speak of the gummy impurities contained in the juice; but only of the matter which constitutes the ordinary scum. It would, of course, be better if all impurities, both soluble and insoluble, were expelled, provided the measure for expelling or removing them did not involve longer boiling and a conversion of a very considerable portion of cane sugar. If it did, it were better for both to remain in the sirup; for if sugar crystallizes, it can be separated from the impurities easily enough; but if the sugar is converted or transformed, the enterprise, so far as sugar is concerned, is a total failure, and the purity of the sirup does not make it any less a failure.

Finishing Point.—It is difficult to give particular directions upon this subject. The operator very readily acquires familiarity with the appearance of sirup in its last stages, and can determine the density it has attained by the manner of boiling—usually by the peculiar appearance and sound emitted by the steam as it escapes from the boiling sirup. As it approaches the finishing point, the steam is liberated in lively puffs with a slight noise, gradually the sirup becomes more sluggish and the steam seems to break away with more difficulty; still later the foam subsides somewhat, and the steam escapes with a more sharp and angry puff, at the same time the sirup assumes a glistening, or some say, a sugary appearance. This is regarded as the finishing point for sugar. The sirup is then immediately removed from the fire and discharged into coolers, where it should be cooled by any appropriate means as rapidly as possible, at least as low as 200°. Some practice stirring or agitating the sirup violently in the last stages of boiling, and for some time after being removed from the fire. The first facilitates the escape of steam and preserves a lower temperature by several degrees in the boiling sirup, which is an important advantage. When working by the intermittent or batch system it is an advantage to stir from the bottom of the evaporator, as it assists the naturally sluggish circulation, by which portions of the sirup are caused to remain long in contact with the heated bottom plate. Agitation long continued after sirup is removed from the pan, produces a foamy state of the whole mass, which is regarded by some as the most favorable for granulation.

Graining.—If a special effort has been made for sugar, it should not terminate when the sirup has reached the coolor, but continue to the end. When it is not convenient to establish a room for graining, the sirup may be put into barrels and placed in a cellar or room where the temperature will be even and as warm as can be secured. Granulation may occur at the end of a few weeks or months. Occasionally stirring and disturbing the barrels will be of advantage.

A properly constructed graining room will, however, be much more likely to consummate the object. This may be of any convenient dimensions and arrangement, provided with places to bestow the sirup and the means of heating and preserving a uniform temperature. The following will be found a good plan for a hot room: It may be constructed in the form of a lean-to against

the side of some other building, or may be partitioned off from the inside of the sugarhouse or other building. Construct the room eight by twelve feet on the inside, make it as close and impervious to air as possible. Arrange, all along on each side, stands for drawers, the latter to be forty inches long, twenty-four inches wide and three inches deep on the inside. The drawers to have their places in the stands, one above another, as high as convenient, say six feet, and to have a space of two inches between each. This will require, allowing the drawer to occupy four inches, a space of six inches for each drawer, and the stand of six feet will accommodate twelve drawers. Allow for three stands on each side of the room, six in all, and the room will contain seventy-two drawers. Each drawer may be filled with sirup to the depth of two inches, which will be eight gallons, or for seventy-two drawers five hundred and seventy-six gallons. Place in the room a good air-tight wood stove, which, upon being supplied with wood, will keep fire and give off an even, regular heat for twelve hours. If the room is made very tight with plastering or paper, an augur hole may be made near the floor and another near the top, for ventilation, but the chances are rare that this will be required. There is much more danger that the room will not be made sufficiently close and will be allowed to cool off frequently between the times of replenishing the fire. The sirup, as soon as cooled down to a temperature of 100°, may be conveyed to the graining room and poured into the drawers, say about two gallons in each at first, and after supplying one-half of the drawers with this quantity, go over again adding as much more to each, and so on until they all contain eight or more gallons. Then fill the remaining drawers in the same way. While they are being filled and as often as convenient, after they are supplied with the quantity they are to contain, the sirup may be stirred. For this purpose use a rod of sufficient length, say thirty inches, with a strip nailed across the outer end, forming a T. It can be worked conveniently without moving the drawers, as the two inches of space provided between them affords room. The stirring process is generally recommended, but we have doubts about its propriety. We think it is best to leave the sirup perfectly quiet. The temperature of the room should be raised and kept as near as possible at 100°. It will do no harm if the temperature fall for a few minutes, while the door is open or the operator working in the room, as the temperature of the sirup will not be sensibly affected by a temporary change.

By the time the last drawer is filled it is hoped the sirup in the first will have become well granulated or resolved into "mush sugar," when the drawers can be emptied and again filled with sirup as before. If granulation is not supposed to be complete, and it is thought best to give more time, bestow the sirup which may be made while the drawers remain thus occupied, in any convenient place, allowing it to remain at rest until it can be transferred to the hot house.

Draining or Purging.—This is the last and not the least difficult operation to be performed. The facility with which the uncrystallizable portion of the mush or rough sugar can be separated from the solid grains, will depend much upon the success which has attended all the previous operations. If the cane was good, if the evaporation was rapidly conducted, without the development of an undue quantity of that tenacious gummy principle which is the great barrier to success in every stage, and if the sugar crystallized out of a solution not originally very dense and not too much concentrated by desiccation in the hot room, the operation of draining will not be difficult. It may be drained in the common molds or cones. These may consist of cone-shaped vessels made of wood or metal of any convenient dimensions, supported over drainpots. The apex or the mold which enters the drainpot has an opening which may be stopped with a plug or a whisp of clean straw. The mush sugar, after being transferred to the mold, should be allowed to remain a few days until the sugar "sets," when the plug or stopper may be removed from the opening, allowing the molasses to drain off from the sugar. If found that the sirup does not separate, but that sugar and sirup come off together, the openings may be stopped and more time allowed. Should the sirup at first or subsequently come off separately, the molds may be left for some days to drain, after which remove a small portion of sugar from the upper part of the mold, dissolve it in water, making a solution of about 25° density, and, having spread two or three thicknesses of flannel over the surface of sugar in the mold, saturate them with the prepared sirup. The sirup being liberated slowly from the flannel, flows down through the sugar, dissolving and carrying down much of the coloring matter from the crystals. The washing may be continued by rewetting the flannels as long as necessary. If desired to produce white sugar, use at a late state in the process of washsirup made of white or well washed sugar, which may be taken from the top of the molds which have been treated with the first wash.

The above process of draining applies only to sorghum sugar under the most favorable circumstances in which it may occur. It is rare that the condition in which sorghum sugar is found will permit of its being drained in molds and washed in the manner described. It will generally be so dense and gummy that the molasses will not separate and come off, or if thin enough to flow, the solid or crystallizable portion will be so closely held by the viscid fluid that both will flow off

together. Other means of effecting the separation must be then resorted to, of which the following are the most appropriate:

Place the mush sugar in a long bag or coarse cloth and suspend it until the molasses drips off, and after draining add and thoroughly mix with the sugar a small quantity of water, enough to reduce the mass to a dense fluid, and drain again as before, rewetting and draining several times if necessary, until the sugar becomes bright and free from gummy impurities.

Another process consists in inclosing the mush sugar in bags and subjecting it to pressure. After once pressing, the sugar may be mixed *thoroughly* with a small quantity of water and repressed, repeating as many times as may be necessary or desirable. This is an *old* process, modern patent rights to the contrarary notwithstanding.

The most appropriate and best means of draining sorghum sugar is afforded by the centrifugal process. This has been used in tropical countries for many years. It consists of a cylindrical screen carried by a shaft revolving at great velocity. The mush sugar is placed in the screen either when it rests or while in motion. The centrifugal force expels the molasses out through the meshes of the screen, and it is caught in an outer case which is provided with a spout to conduct it off. A centrifugal machine can be made to work by hand, though the operation is laborious, and for any considerable amount of work it should be propelled by more competent power. All the operations of draining should be performed in a warm room, and the mush should be warm. It will frequently be found quite impracticable to drain sugar without adding a small quantity of water to the mush to render the viscid sirup sufficiently fluid to drain or separate from the solid grains.

Conclusion.—We are persuaded that the production of sugar from sorghum has been much retarded by a false notion that it required the exercise of some secret craft, that it is to be accomplished by the employment of some great sovereign specific which is to *make* the sirup crystallize. This has led operators away after false lights and has deterred them from employing the only means which will ever give success to the enterprise means which they have in their own hands and without the use of which nothing else will avail. It should be distinctly understood that sirup frequently contains not one single grain of true sugar, and from such sirup no man living can produce crystallizable sugar. Carbon has been made to crystallize and afford artificial diamonds, but no man has ever yet succeeded in making a particle of artificial sugar cane. It is produced alone in the great laboratory of nature. All that art or science can do is to precerve it unimpaired and separate it from excess of water and impurities with which it is associated; it will then crystallize as nat urally as water freezes or crystallizes when reduced to the proper temperature. Sirups frequently contain so little crystallizable sugar, that is, the atoms are so far removed from each other, that they fail to attract and unite into visible grains. No sugar can be extracted from such sirup. Sugar may be present in sufficient quantity, but the viscid medium in which it is held may be so dense as to obstruct and prevent crystallization. But the occurrence of this substance may be in a greater measure prevented, and the production of sorghum sugar rendered successful, regularly and permanently, by simply attending to the business at every step in the operation, from the selection of the seed and soil to the final operation of graining. It is not to be accomplished by any magical or sleight of hand process. Sugar making requires good, square, intelligent work, and nothing else will suffice. The man who pretends to produce sugar from sorghum by any process which does not contemplate a strict compliance with all the conditions which nature imposes, or who proposes any substitute for strict fidelity to those conditions, is either ignorant of the business or a willful deceiver.

HAWLEY'S TUBULAR EVAPORATOR.

The above new evaporator promises to be a valuable improvement in the manufacture of our northern sugar cane. It is claimed for it that it is superior in every respect to the best steam evaporator, while it costs only one-tenth as much.

The manufacturers give the following description, which explains the cut:

The principles involved in the construction of this evaporator will be readily understood by every person acquainted with the common tubular boiler, by supposing the top taken off a locomotive boiler and a partition placed between the fire-box and the flues, crosswise the boiler, and another lengthwise and between the flues, so as to form three pans, which are filled with sap or juice in place of water.

The outside of the whole evaporator, including the front end and the bottom of the back pans is all wood. The first pan, known as the "defecator," and denoted in the cut by "a," is provided with three series of flues, and three in each series. The "defecator" is capable of holding from twenty-five to one hundred gallons, according to the size of the evaporator, and the sap or juice

received into it at the back end as it flows from the mill. Here the sap is brought slowly to a boiling point, gently boiling at the end nearest the fire, that causing a current from front to back end, carrying the scum back in convenient shape for skimming, and forming a most perfect defecator. When defecated it is drawn into the front or "main pan," "*b*," through a peculiarly made faucet or gate, the opening of which is covered with gauze wire, denoted in the cut by "*c*," but situated on the opposite side of the evaporator, and midway between the top and bottom of the defecator, thus avoiding the scum from the top and the sediment from the bottom. In this pan the sap is brought immediately over the top and around the two sides and door end of the fire-box, filling a space only one inch in thickness between the sides and door end of the fire-box and the wooden sides and end of the evaporator, thus causing it to boil more rapidly than in any evaporator now in use. When the sap has reached twenty-five degrees Beaumi, it passes by the gate, "*c*," into the finishing pan, "*d*," situated parallel to the defecator. This pan is furnished with only one series of flues, six in number, lying near the bottom of the pan, which, being of wood, presents exactly the same appearance as in a steam evaporator, except that the pipes run straight through the pan instead of turning and returning by double elbows as the steam pipe does. In this pan we control the boiling exactly in accordance with the fancy of the operator; and by the means of a peculiarly arranged damper the hot air can be entirely shut off, and at the same time a current of cold air turned into the flues, producing precisely the same effect as it would to remove an ordinary pan altogether from the fire. So nicely are these dampers adjusted that, after the sap is once boiling, it can be made to cease boiling in the short space of three seconds, or made to boil again in the same length of time; or the rapidity of the boiling can be increased or reduced to any degree at the will of the operator, thus enabling him to finish off the sirup at any required density as perfectly as by any steam evaporator. The defecator is also provided with a like damper. These dampers are worked by a crank, "*e*," but being situated under the fire-box, and out of sight, cannot be shown in this cut.

After the sirup is finished it is passed from the finishing pan through the gate, "*f*" into the "*cooler*," which is of the same length as the back pans, and extends under both of them, and is capable of cooling the sirup as fast as it is made. The opening, "*g*," in the side of the cooler permits the heat and steam arising from the cooling sirup to escape. After the sirup is sufficiently cool it is drawn through the gate, "*h*," into the barrels, thus avoiding the well known danger of burning which attends drawing hot sirup into closed packages.

The fire and smoke is conducted from the fire-box through copper flues into the smoke-arch, "*i*," and from thence into the smoke-stack, "*j*." The grate is hung upon hinges, so that when the work is done at night the fire can be easily dumped into an ash-box, if the evaporator is used as stationary, or on to the ground if used as portable, and in five minutes the evaporator is entirely cool. The fire-box and flues are all of copper, so that the sap comes in contact with only wood and copper, thus making the neatest pan possible for producing light-colored syrups or sugar. And thus complete, the whole thing is mounted on wheels, and an evaporator that will use the sap from a two-horse mill can be drawn over any common road by a boy, and with the greatest ease.

All will see that by the arrangement of this evaporator we have all the advantages of a steam evaporator, and yet they can be furnished for one-tenth the money that a steam evaporator and boiler cost; and as the whole outside is of wood, and therefore a non-conductor of heat or cold, there can be no radiation of heat except through the sap. Consequently it follows that we can evaporate with less fuel than a steam evaporator. And we will guarantee to do as much work with this evaporator as can be done with any other extant (except a steam evaporator), with from one-half to one-third as much fuel. The fire-surface exposed to the sap in this evaporator is four times greater, in proportion to the fire used, than that of any other evaporator in use, which, together with the non-conducting properties of the wooden sides, accounts for the great economy in fuel.

FLAX AND HEMP.

In some localities of the state hemp was formerly cultivated to a large extent. Its cultivation was nearly suspended during the war, but has to some extent been resumed since. The main difficulty in the way of a more extended cultivation is the scarcity of labor. It is to be hoped that improved machinery will soon overcome this difficulty to a great degree. The new hemp-brake of Sandford & Mallory was exhibited at the St. Louis fair, and tried with rather satisfactory

results. There is little doubt that it will be so perfected, if not already done, as to be a very important implement to our hemp growers.

Flax has never received the attention that it merits. There has probably been no time when flax has been cultivated in the state to the extent of producing half the amount of seed required and used by our oil mills; at the same time, the flax crop for the seed alone will pay as well as the majority of other crops. Some large crops have been grown in the state the past year, it is presumed for the seed. One farmer in Lafayette county raised sixty acres. We have not been able to learn the results.

To render the flax crop most profitable, both the seed and fiber should be used. We consume a large amount of linen goods, both coarse and fine, while the flax straw grown in the state is mostly wasted. The proprietors of our oil mills have expended no small amount of money for the purpose of inducing our farmers to grow flax for the seed. If these parties had directed their attention to the introduction of machinery for dressing the fiber they would have accomplished their purpose much more effectually, for the simple reason that it would have made the crop much more profitable to the grower—almost doubly so. At several points in Illinois such machinery has been introduced, and is working successfully, according to reports, and affords a good market for all the flax straw grown in such vicinities. It is regretted that an opportunity was not afforded the past year to learn the facts definitely in regard to the operations alluded to. The importance to every locality of manufacturing all crops that can be grown and manufactured profitably, can scarcely be over estimated. It is important to the manufacturer and still more to the farmer. To bring the manufacturer and the producer into as close contact as possible, is essential to the wealth of any community. Without it, the farmer receives as mall price for his produce and pays a large one for his manufactured goods, while railroads, steamboats and wharehouses eat up the profits.

BROOM-CORN.

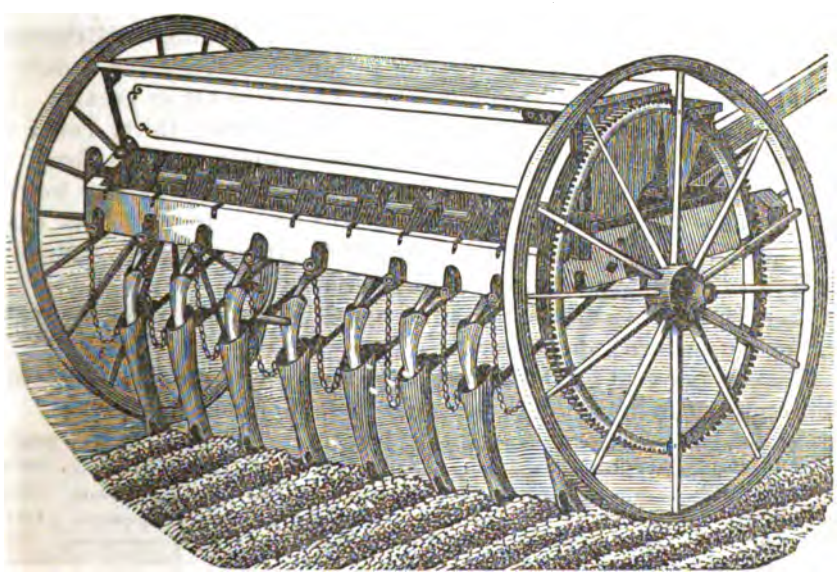
On the rich alluvial bottoms of the Mohawk river, in New York, and other similar localities, broom-corn is very extensively and profitably grown. It has never received much attention as a market crop in Missouri. During the past year several large crops were grown, and recently there has been much inquiry for information in regard to this crop.

Our deep, rich river bottom lands cannot be excelled for the purpose of broom-corn culture. Any of our moderately rich soils will produce very profitable crops of it. It will pay well to grow broom-corn for the brush alone, at present prices, much better than corn or wheat. In addition, it will yield fully seventy-five bushel of seed to the acre on good land, which is generally considered quite as valuable as oats for feeding to stock.

According to the census returns of Massachusetts for the year 1865, in one county of that state where broom-corn is most largely grown, there was an average yield in value per acre of a few cents less than one hundred and fifty dollars. In such localities as the Mohawk valley or our own river bottoms, the result would probably be much greater.

Mr. M. A. Kitchen, of Harrisonville, Cass county, Missouri, raised a crop of broom-corn the past year and writes as follows in regard to it: "Of the broom-corn I have had a fair crop. My ground was deep and well plowed. My corn was planted three and a half feet by twenty-one inches. I plowed it all one way. I dropped the seed by hand and covered it the same way. There was nothing peculiar about the cultivation of the corn, more than that it was well done.

"In growing, the corn or rather the seed, was allowed to get fully ripe. The brush is now a bright color, quite green and very tough. In gathering my corn I broke it down in tables, two rows together, one across the other, one man breaking something over an acre a day. In cutting, one man would cut near an acre a day. After cutting, and as being cut, it was laid on the tables to cure. As soon as cured and dry, and before rain, it was hauled and put under a shed, with the seed on the brush, and there it remains to some extent yet, perfectly cured and in fine condition. I feed the seed to my stock and remove it from the brush as I need it for use. I have fed my work-horses on no other grain for the last three months. My cows and hogs are all fed on it, and are all fat. I do not know just how much brush I had to the acre; I think, near half a ton. The yield of seed is near seventy-five bushels to the acre, and according to my experience it is worth as much as oats, in measure, for feeding to stock."



PISTON GRAIN DRILL AND BROADCAST GRAIN AND SEED SOWER COMBINED.

This we believe to be a superior implement of the kind. It is manufactured at Belleville, Illinois. Its principle of construction and mode of operation is entirely different from other drills, having neither a vibrating, rotary, nor revolving motion, but a perpendicular motion, with a peculiarly constructed iron piston and apperture, which measures and cleans trashy wheat, rye, oats, barley, hemp, buckwheat, broom-corn, sorghum, millet, Hungarian, clover and timothy seed, in a uniform and continuous stream.

HOP CULTURE.

We do not know that the hop is cultivated in Missouri at all, except for family use. We have seen hops growing wild in various parts of the state, flourishing admirably, and seeming to be as good as those in cultivation. Hops are consumed very largely in the state, particularly in the city of St. Louis, and are supplied mainly from New York state. The crop is found to be a very profitable one in Michigan, Ohio, New York and other states eastward. In our mild climate, where the hop grows naturally, and so perfectly, there seems to be no reason why hop culture should not be much more profitable than in New York state, where the crop is more precarious, on account of frost, and where smaller prices are obtained for the crop than could be obtained here.

Some Germans in Franklin county, several years ago, commenced the cultivation of hops to some extent, we understand, without very good success. The only reason we have heard for the failure, or partial failure, is that the proper mixture of male and female plants was not understood and practiced. The yield of hops per acre, as shown by the last census, in counties where they are most extensively grown, has an average of about eight hundred pounds. By high cultivation, two thousand pounds, and, in some instances, twenty-five hundred pounds, are said to have been obtained. The price varies greatly. In St. Louis the range in different years is about from thirty cents to eighty cents per pound. The price most usually paid is forty to seventy cents. Present price about sixty cents. It will pay better here to raise hops than in New York state; certainly until the crop becomes largely cultivated. It will not be unreasonable to expect a yield in value of five hundred dollars per acre.

It is believed that $300 per acre, net, is about the ordinary yield among the eastern hop-growers.

A correspondent of the Wisconsin Farmer furnishes the following facts and figures in regard to the profits of hop-growing:

Value of land, seven acres at $60	$420 00
Cost of 12,000 poles, at 6½ cents	780 00
" hop-house	700 00
" press and furnaces	140 00
" hop-boxes	50 00
Making the total permanent outlay	$2,090 00

Charging to this year's crop 20 per cent. for wear and interest, we have 20 per cent. of $2,090	$418 00
Cost of cultivation and manure	542 00
" picking, baling and marketing	1,440 00
Total expenses	$2,400 00
Received for crop	8,150 00
Net profit of crop	5,750 00

This field yielded 17,139 pounds of hops, being an average yield per acre of 2,448 pounds, and a net profit per acre of $821 42.

Our object is to call the attention of farmers in Missouri to the importance of this crop, which, so far as we know, is entirely neglected at present as a market crop. To do this more effectually, and to put the necessary information in the hands of those who may desire to cultivate hops, we have obtained permission from Orange Judd & Co., of New York, publishers of a pamphlet on hop culture, to insert here the illustrated premium essay from that work.

Any one intending to engage in hop culture, and who is not thoroughly acquainted with it, should of course procure the work alluded to. It gives the details and illustrations of the various other modes of management, curing, etc.

THE HOP—DESCRIPTION, HISTORY, AND USES.

The hop-plant grows wild in Europe, Asia, and North America; and, though cultivation has produced several varieties, there is but one species, humulus lupulus. The plant has a perennial root and a twining stem, which dies down to the ground every year, but remains alive below the surface, where there are numerous strong buds to supply vines another year. The vine, which twines from right to left, is somewhat angled and rough. The leaves are opposite, but sometimes alternate on the upper branches, and on long and often twining foot-stalks. The larger leaves are three to five-lobed, while the smaller are more or less heart-shaped, and all are rough. The flowers are very numerous; the staminate or male flowers are usually produced on different plants from the pistillate or female ones, though sometimes the pistillate plants, according to the investigations of Dr. Royle, produce a few staminate flowers. The staminate flowers

FIG. 1. BRANCH OF STAMINATE HOP-VINE.
Reduced in size, and showing at the lower left-hand side a single flower of the natural size.

FIG. 2. BRANCH OF A PISTILLATE HOP-VINE.
(Shown in reduced size.)

are produced in loose clusters, like those in Fig. 1; they are of a yellowish green color, with a five-pointed calyx and five stamens. The pistillate flowers are borne at the base of scales which are arranged in close clusters on a short stem; these clusters, when ripe, form the product known as hops. When in blossom the young hop will be found to be a collection of very simple flowers, each consisting of a single pistil surrounded by a sort of membranous covering, and one of these is placed at the base of a small scale, which, as the hop ripens, increases very much in size, and becomes the most conspicuous part of the cluster of fruit, Fig. 2. The fruit, botanically speaking, is the ripened pistil, which is a small nut which incloses a single seed. Upon the inner side of the scales, and around the fruit, are found numerous yellow grains which are peculiar glands; and though they are produced only into the pistillate plant, they are often incorrectly called the pollen. These grains are called lupulin, and sometimes "lupulinic glands" and "flour of the hop." When highly magnified, the grains of lupulin appear as in Fig. 3. When fresh, the lupulin is very resinous, adhesive, and aromatic; and it is upon this that the peculiar odor, taste, and other properties of the hop in a great measure depend. This being the case, the greater or less abundance of lupulin in a sample of hops, is one guide in judging of their quality, and it will be seen that, in all the processes of preparing them for market, care should be taken that this be not lost. The lupulin varies from one-tenth to one-sixth of the weight of the hops.

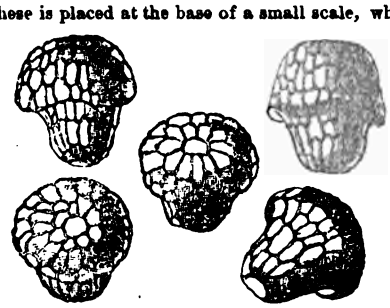


FIG. 3. GRAINS OF LUPULIN, HIGHLY MAGNIFIED.

The bitter, aromatic taste of hops is well known, and, like other vegetable bitters, they have a tonic effect upon the system, and are used in medicine. Beside being a tonic, hops have also a sedative action; and they, or preferably the lupulin, are frequently prescribed by physicians in derangements of the digestive organs attended by nervous excitability. A narcotic property has long been ascribed to the odor of hops, and it is stated that the air of buildings in which large

quantities of them are stored, has the power of inducing sleep. Though this property of hops is denied by some medical men, others consider that a pillow of hops is efficacious in overcoming wakefulness, a remedy which became popular from its alleged success in the insanity of George III. Lupulin is kept in drug stores, and is used in the form of tincture, or it is made into pills by rubbing it up in a warm mortar. The great use of hops, however, is as an addition to ale and other forms of malt liquors, to which they are added for the purpose of flavoring them, as well as to preserve them from the acetous fermentation.

Hops have long been used in brewed drinks on the continent of Europe, and the hop grounds are mentioned in the ninth century in Germany. They are believed to have been introduced into England from Flanders in the reign of Henry VIII. Before this time, a bitter plant called "ale-hoof," and others, were used in brewing. So great was the prejudice against the use of hops, when they were first introduced, that the city of London petitioned Henry VIII to prohibit their use, "in regard they would spoil the taste of drink and endanger the people," and the king issued an injunction "not to put any hops or brimstone into the ale." The enormous consumption of hops at the present time in England would show that the people of that country have outlived at least one prejudice.

The young shoots of the hop vine, especially in the beer countries of Europe, are esteemed as an article of food. The tender shoots are taken when they just appear above ground, and are cooked and eaten like asparagus or greens. We recollect a meal furnished us in Bavaria, at which the only drink was beer, while a good part of the food was the materials of which the beer was made; barley boiled and served as a vegetable, and the young sprouts of the hop, which seemed to be regarded as one of the delicacies of the spring season.

It is believed that the following essays give complete directions for the successful culture of hops. The essay taking the first prize advocates certain patented processes, and the editors did not make the award without consulting those familiar with hop culture. They would acknowledge the valuable services rendered them in making their decisions, by the Hon. G. H. Andrews, of the New York State senate. Mr. A. was formerly editor of the Hop-Growers' Journal, and is thoroughly conversant with all that relates to hop culture. Those who prefer not to avail themselves of the patented processes, will find the ordinary methods of growing hops more fully treated and illustrated here than in any other work. After the prize articles, the essays are not arranged in any order indicating their relative merit, and each presents some details of practice different from the others. Scarcely any of the essays, except those to which the prizes were awarded, are printed in full, as it was necessary to condense them a great deal to avoid unnecessary repetition.

PRIZE ESSAY, BY HEMAN C. COLLINS, MORRIS, OTSEGO COUNTY, N. Y.

VARIETIES.—There are many varieties of hops cultivated in this country, but English cluster and grape hops succeed best. The Pompey hop is very large, with long arms, but it is more injured by rust and insects than the first mentioned, on which the hops hang in large clusters, and both are early varieties.

SOIL AND SITUATION.—The situation for a hop yard should be such that there is a free circulation of air—never by thick woods in a valley, for there rust, blight, mould, and lice most abound. They should have plenty of sunshine, which is the surest preventive for all these. The soil should be dry in winter, and have no water on the surface at any time. If not naturally rich enough, it can be made so by manuring. Any soil where good crops of corn or potatoes can be grown is suitable, but it should be easily worked and kept mellow, as there is much cultivation to be done. Where wheat will not grow, the soil must have lime, if hops are planted. In central New York they are raised on very high land, where none but the smaller varieties of corn will grow.

PLANTING.—The best time to plant a hop yard is in the spring, as early as the ground can be worked. The ground should be plowed and made as fine and mellow as possible; then stake it off, and either mark it out with a plow or line it, and plant with a "dibble," which is the surest way to have the plants all live. Corn, potatoes, or any other hoed crop, can be raised the first year with the hops. The rows should never be less than eight feet apart, and on the rich bottom lands of the west, nine or ten feet is better. Make the hills the same distance apart both ways, and the rows perfectly straight. It is a great mistake to have the hills crowded, as they often are in some yards, to seven feet each way, or even less.

The sets for planting are runners from old vines, which can be had from any old yard. Care must be taken to keep the sets from male plants separate from the others. The hop is a diœcious plant, that is, having the staminate or male, and the pistillate or female flowers, on separate plants. There should be about one male hill to every eight hills, each way, or one in sixty-four, making from eight to twelve to the acre. These hills should be marked by a stake at planting, to enable

one to distinguish them at a glance. The sets should be cut to two pairs of eyes each (if very short-jointed, three pairs of eyes may be left), and three to five of these should be put in a hill, according to the condition they are in. They are usually planted in a furrow made by a plow, which must be from two to four inches deep, according as the soil is light or heavy. If planted too deep, they will not come up well. Sets are usually sold by the bushel; two to three bushels for an acre. When yards are planted with good, fresh sets, and it is done early, there is very little risk of failure. Often large yards are planted without losing a single hill. When the ground is very mellow, with but few stones, dibble the holes just deep enough to let the sets be under the ground, and three or four inches apart; press the soil around them, and mark the place with a stick.

CULTIVATION THE FIRST YEAR.—The cultivation consists in keeping the weeds down and the ground mellow. One day's work in season is better than two later. If good sets are used, and they are planted very early, it will pay to raise a crop the first year, and the plants will be the better for it. Set one stake to each hill, and let all the vines run upon it. The stake should be but eight feet long, and set one foot in the ground; if longer than that, the vines will not get to the top in season to "hop" well. It is best to stake the plants, because then they are out of the way in cultivating the yard, and do not get torn off. We raise from two hundred to four hundred pounds to the acre the first year, at no cost except picking and drying, besides the cultivation, which must be done even if none are raised. The stakes may be pieces of old hop-poles, or better, one and a quarter inch square sawed stuff, eight feet long (there is one foot board measure in each stake). It pays well to get gas tar, which costs but one dollar or two dollars per barrel. Heat it in a pan made for the purpose, and dip the whole stake into it while it is hot. This makes a firm coat of paint on the stake, protects it from the weather, and at the same time is very offensive to insects, and plant lice will not lay their eggs on it in the fall. In the autumn of the first year, a covering of two forkfuls of coarse manure should be given the hills, and if there is any chance of water standing on the surface, furrows must be plowed for surface drains, for it will kill the hills it covers. Cattle should never be pastured in hop yards in the fall, especially not in young yards. There should be no grass for them to eat, though there too often is.

TRAINING.—Throughout the hop region of New York, young trees have been cut, for many years, for use as hop-poles. This has gone on until the price has risen from two or three cents to twenty or thirty cents each, and large quantities are brought from Canada and the wilderness of northern New York, by canal and rail, and then drawn with teams to the yards, frequently from ten to twenty-five miles. Hard-wood poles last from two to five years, the best cedar poles but ten, and many poles break down with their load, or are broken down by the wind every year, which causes a total loss of the hops on them, and frequently on one or two adjoining poles. The common method allows two poles, eighteen to thirty feet long, to each hill. Being so long, the wind whips them, breaking off many of the arms, so that often a considerable part of the crop is destroyed in this way. When the crop grown upon the poles is picked, many hills are killed, and all are injured by bleeding of the vines, which must be cut off.

HORIZONTAL HOP-YARD.—There is a new method in vogue in this state, which has been used in Otsego county, to some extent, for three years past, and the last year it was used all through this, and in some other states, namely, "Collins' horizontal hop-yard." It was described in the American Agriculturist for May, 1864, and a section of the yard is shown in Fig. 4. I shall confine my directions for raising hops mostly to this plan, as I consider it as far superior to the common plan, with long poles, as the mower and horse rake are to the haying implements used by the last generation. There is but one stake to the hill, and this is eight or nine feet long, and set one foot in the ground. The best and cheapest stakes are one and a quarter inch square sticks, sawed at any sawmill, left rough, and entirely coated with coal tar. Where this plan is introduced into old yards, old poles, cut in two, are used; yet it is far better to use the square stuff above described, than to cut down a tree for each stake.

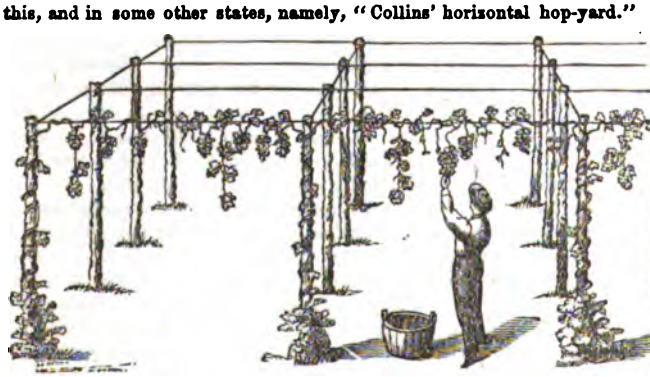


FIG. 4. HORIZONTAL HOP-YARD.

The outer row of stakes should be eight or ten feet outside of the outer row of vines, and where next a fence, put them on the line of it. These should be two and a half inches square, or if round, about as large as a common hop-pole, and set a little deeper than the others. For the inside hills, round stakes, an inch through, are as good as larger ones. The tops of all the stakes are connected by a twine running accross the yard both ways—it is tied to the outer stakes only, and wound once around the inner ones. Use good twine—wool or broom twine, made out of hemp or linen. At the present price of twine, it is best to raise the flax and spin it, two or three threads making a small twine that will measure about seven hundred feet to the pound; this is strong enough, and lighter is often used, and if tarred with good pine tar it will last several years. Tarred hemp twine at present costs twenty-five to twenty-seven cents per pound at wholesale in New York, and from thirty-five to forty cents through the country. A kind should be used that will not weigh more than twenty-five pounds per acre; but I like best a good home-made twine, at about fifteen pounds per acre. The cost for twine is at present from six to ten dollars for an acre; but four years ago it cost only three or four dollars.

At the male hills, put one tall pole, about eighteen feet long, so that the male vines will run up it, and the wind can blow the pollen over the yard. The string should pass these polls free, so that the wind will not break the twine.

The cost of preparing a yard in this manner is as follows: 750 feet lumber for stakes, at $15 to $20; gastarring stakes, $2; 25 pounds twine, at 30 cents, $7 50; setting stakes, $1; putting on twine, 50c; right per acre, $10. Total cost after setting vines, $36. Cost of yard with long poles: 1400 poles, 20c each, $280; sharpening, $10; setting, $7. Total cost (not counting hauling) after setting vines, $297.

Second Year.—In spring, the yard, as soon as dry enough to work, must be grubbed. Hoe the dirt from the hill without injuring the crown of the root. With a knife, cut off all the old vines smooth, and any runners that are seen. Never tear them off nor cut them with the hoe. At the same time examine whether there are any grubs in the hill, and kill all found. There are two kinds of grub—one which makes a beetle, with a dark, hard head and white body, with legs all on the fore part of the body. It is always found doubled up like a horseshoe. The other is a caterpillar which makes a butterfly. Both must be killed wherever found. Leave the hill nearly bare. If the stakes are in the yard, they must now be set; but if not, it is best to plow first. In setting, use a common light crowbar, and set about a foot deep, rather deeper for outside hills, and nearly twice as deep for the long pole at the male hill. Then plow out the yard, and after plowing, take out the runners or sets. These are only found in a yard after the second year, and if well saved, are worth from fifty cents to one dollar and a half per bushel. Break them as little as possible, and do not let them lie long in the sunshine, nor be frozen while out of the ground. In setting the stakes, all the holes should be on the same side of the hill, so that in plowing you can tell how to guide the horse, that he may not step on the crown. After taking out the sets, hoe the dirt back upon the hills, so that the ground will be nearly level, and put on the twine. When the stakes are but seven feet high, a man can easily put it on from the ground, but a boy or girl can do it with a light stool. The twine is carried in a basket slung over the shoulder, out of the way. Never tie the twine except at the end stakes, and only wind once around the others, passing at the tall poles of the male hills. Have all stakes the same length. When the vines get up two or three feet high, they must be tied. Tie four to each stake, except in the outer row of hills, where five or six may be tied, so as to fill the strings to the outer row of stakes. Put the vines around the stake the way the sun goes, or they will not run, and tie with soft bass matting, or old woolen yarn.

Cultivate often, for it will save a great deal of hoeing. The five-toothed cultivator is best, but when the yard gets grassy, the plow is the only thing that will do the work. Never let the weeds get the upper hand. The vines will need tying up as often as any leave the pole, but it must never be done on a cold day, nor early in the morning, as then they will break, and whenever one has its head broken off, it must, if not up to the strings, be taken down, and another vine from the ground be put in its place. When the smallest vines have got a good start, three feet or more, bury the refuse vines at the foot of the stake with two inches of dirt, and never pull or cut them off, as is usually done. In a few days the leaves will rot, making manure, and the vines will make cheaper food for the grubs than those running up the stake. These vines throw out small roots, and help to make the crop for the year; besides, they are the best kind of sets for a new yard the next year. Mix air-slacked lime and unleached ashes, and put on about a pint to each hill; this will help to keep away grubs, and serve as manure.

When the tallest vines are up two feet above the top of the stakes, go through the yard and lay them on the strings, winding them loosely once or twice around. Put the vines on the strings while they are growing very vast, about twice a week, or when they are two or three feet long, letting them hang down six inches. When the vine has passed the first space, let it run past the stake, on to the

string having fewest vines on it, and when it gets to the middle of the second string let it hang down like an arm. Sometimes I have seen vines stopped when at the second stake, but I do not like the way so well as to let them run further.

Never put the arms upon the strings, but let them hang down or wind into each other; they will not break by hanging, and will be more exposed to sunshine and air. When they are so long as to brush the ground, lay them up on others, winding once around, and they will stay. If the vines have been so planted that the male vines cannot be told, let them run up on the strings, but mark them in the fall, so as to put in a tall pole; for, if grown in this way, the pollen will be better distributed.

PICKING.—The hop is ripe when, on opening it, the seed is hard and of a purple color. After that, they turn brown, and the seeds drop out, and there is a great loss both in quality and weight. Of course, in a large yard, all the hops cannot be picked at exactly the right time. If the yard is a large one, the hops will be ripe sooner in some parts of it than in others, and should be picked first, and, indeed, some must be picked rather too early, in order that none may be left much too long. Commence when the seed begins to get hard, and but few are yet purple. In horizontal yards this is about a week earlier than where long poles are used, and as there is no cutting off of vines, they do not bleed as in the old way.

At first do not hurry up the picking too fast, as while the hops are rather green the kilns must not be filled more than ten or twelve inches deep, and it takes longer to dry them than those that are riper. After a few days, when the hops are fully ripe, it is best to get one half more pickers than at first, as on a good kiln the hops can be dried from sixteen to twenty-four inches deep, and two kilns full can be dried in a day.

Those conditions of the air which produce rust in wheat seem to have the same effect on hops. It sometimes comes on very soon after a warm shower. High land is most free from rust; the worst place is a deep narrow valley near a stream, and sheltered by woods.

Hops can be picked from the strings, either in the common way with boxes and box-tenders, or by girls with baskets, without help. I like the latter way best, as it saves three-fourths of the time usually spent in tending box, and the hops are picked cleaner and faster. I will descibe both ways: First, with light willow baskets, which will hold three or four bushels, commence at the ripest part of the yard; loosen the strings from the stakes, and let them drop until held by the vines; they will then be about five feet high, and can be pulled lower as wanted. A large girl, or a man, can take the strings off the stakes.

Pick clean. Put the fingers through between the hops in the bunch, instead of around it and stripping, as is often done. Put in all the hops, but none of the large leaves, and as few of the small ones as possible. Often there is no care taken to keep out small leaves, but for a prime article very few should go in, and no bunches of more than three hops should ever be allowed in the basket.

The owner, or some very careful man, should empty the baskets into sacks as they are filled, and see that all are picked well. Where any are found with bunches of hops, or any large leaves, the picker should sort them and pick them all out For this the most careful man is required, and every careless girl in the yard will abuse him as much as she can. Good pickers will gather twenty-five to thirty bushels per day well, but wages should be based on about fifteen bushels for a day's work, as many girls will not pick more than that.

FIG. 5. "SET" FOR FOUR PICKERS.

Sacks for carrying the hops to the kiln should hold about ten or twelve bushels without packing, as the hops, if pressed in, will soon heat and turn black. The bags must never be left full of hops over night. Burlaps make good cheap sacks, and once made they last for many years. The vines are left on the strings, so as to mature the root for another crop, until they are killed by the frost; then it is best to take them down, strip them off the strings, and burn them. In this way the eggs of the plant-lice are mostly destroyed. Where the picking is done with boxes these are made of various sizes; sixteen thousand eight hundred and seventy-two cubic inches is the size required by a bill proposed in the last legislature of New York, but the bill did not pass. The boxes, usually holding from seven to ten bushels, are made about three feet long, with a partition through the middle, and two of these double boxes, with a platform three feet square between them, make a "*set*" for four pickers. They are of half-inch basswood, with handles at each end. A man (or a girl) called a "box-tender," who has a large basket, knife and light stool, pulls off the arms from the vines (they break out easily by a pull toward the root of the vine), and with the knife cuts off the end of the main vine, which hangs down. As fast as he fills his basket he empties it on the platform, thus leaving the main vine with most of its foilage entire, and preventing injurious bleeding.

When the hops are good, and the strings not more than seven feet high, one man can tend two sets of pickers, eight boxes, as easy as he can one where they are nine feet high. The man who tends box should never be required to sack the hops. Broken arms are to be thrown away when the hops on them have turned brown; for, if put in, they will injure the sale of all. A man who has the reputation of picking his hops clean, and putting them up nicely, will get a little extra price for them, and find quicker sale when hops are low. The difference between "fancy" hops and "common sorts" is always enough to pay the whole cost of raising the crop. Only the best hops have the advantage of a foreign market. The price for picking varies from twenty to fifty cents per box. Owners usually board the pickers, and if they are treated well, they will find it all the easier to engage them another year.

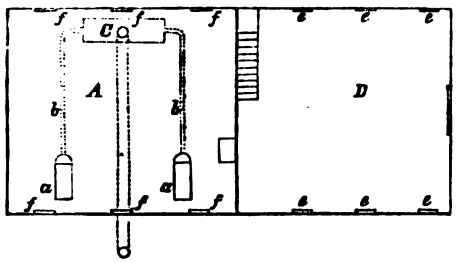


FIG. 6. GROUND PLAN OF HOP-KILN.

A, stove-room; *a a*, stoves, with grate-bars at bottom to allow the ashes to fall upon the ground; *b b*, pipe; *C*, sheet-iron drum; *f f*, air-holes in stove-room; *D*, baling-room; *e e*, windows to baling-room; stairs are shown going from the baling-room to the drying-room above.

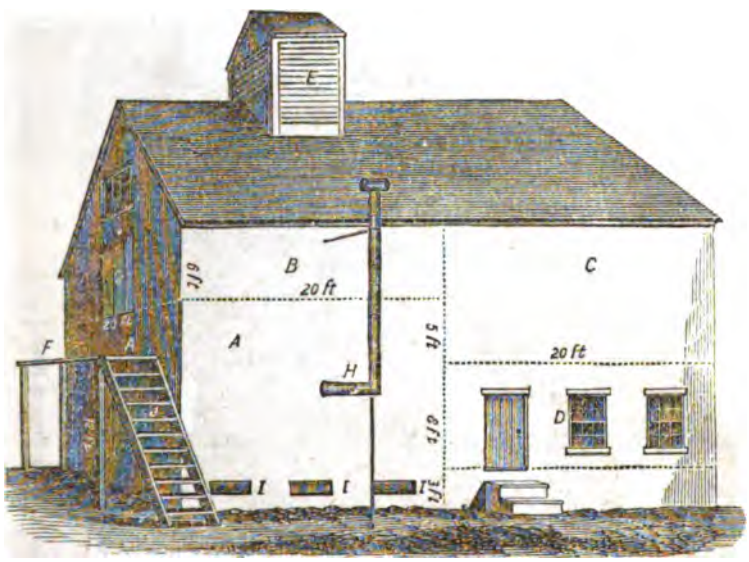


FIG. 7. ELEVATION OF THE COMMON HOP KILN.

A, stove room, with stone, brick, or plastered walls, but no floor; B, drying room; C, store room, which has a window in the end, not shown, with tight shutters; E, ventilator; F, platform from which to pass up the bags of green hops; G, door into drying room; H, pipe, or smoke stack from stove, which is to be taken down when not in use; I, air holes; J, stairs to platform. The usual dimensions are marked on the diagram, but these may be altered to suit the size of the yard.

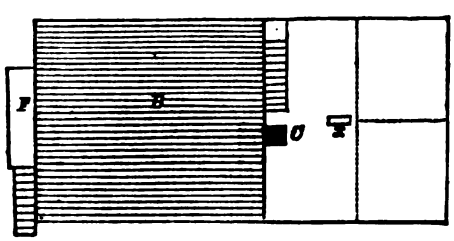


FIG. 8. SECOND FLOOR OF HOP KILN.

B, drying floor, with slats one by two and a half inches, set on edge, and supported by joists two and a half feet apart, running across above the stove room, and covered by carpet; C, store room; X, trap through which to pass down hops in baling.

Drying the Hops.—The kiln should be proportioned to the amount of hops to be dried. It is usually divided into four rooms. The stove room, where fire is made, should be not less than fourteen feet high, and sixteen or eighteen feet is better, with stone or brick walls, and no floor; if the walls are of wood, they must be plastered to the top of the room. At the bottom of the walls there must be six air holes, one by three feet, with doors to close them tight when necessary; and if the kiln is very large, there must be more than six. The stoves, usually two, are large enough to take in three feet wood, with grate bars at the bottom, and very large doors; the pipes are carried once or twice across the room, as near the level of the top of the stove as possible, and then go into a chimney on the outside of the building. Great care must be taken not to have the pipes touch the woodwork, as it is kept so hot for a long time as to set fire to any woodwork near it. The pipe is often run several feet from the building and turned up like the smoke stack of a steam boiler, to make a good draft. There is a door from the stove room into the baling room, with a light of glass, so that the man who attends the drying may see the state of the fires without going in; a thermometer on the inside shows the degree of heat at a glance.

The drying room is over the stove room. Usually these are joists laid across the top of the stove room, and wooden slats, one inch by two, are laid on them on edge, two and a half inches apart. On this there is laid a carpet—usually made of flax or hemp, with small threads, twisted hard and woven loosely, so that the spaces between them are about one sixteenth of an inch or more, allowing air to pass through it freely. It should never be of cotton.

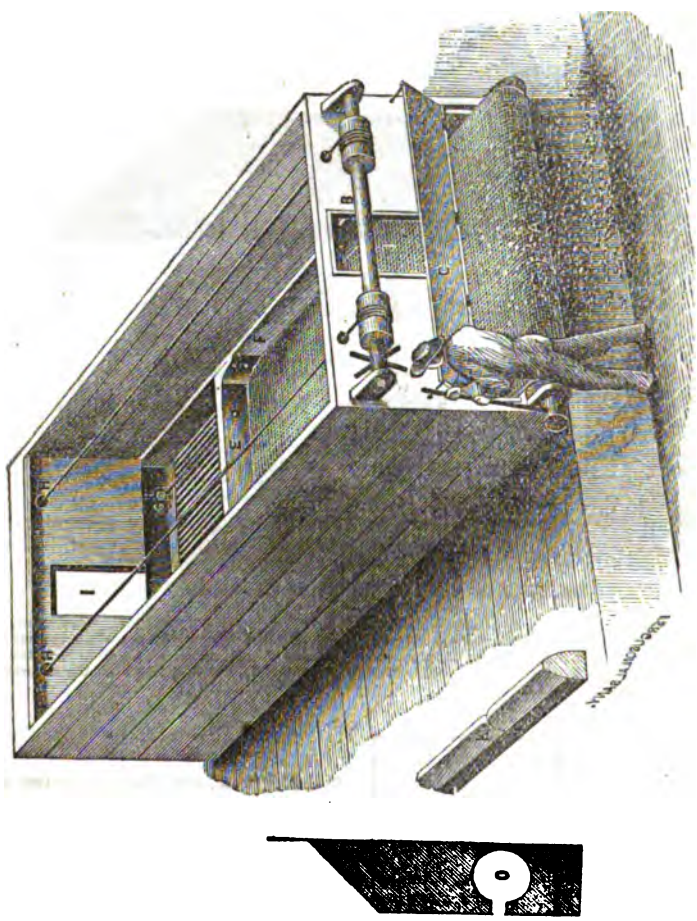


Fig. 9. The France Kiln.

I, the door to receive the green hops; E, the movable carpet, which is represented as being rolled by a windlass in the store room through the opening covered by the lifting shutter C; B, a windlass for drawing the carpet back by means of the rope H H. The small figures at the left show the form of the slats and opening for the passage of the ropes.

The best kiln I have ever seen is one which has a movable carpet, invented by Edward France. Wires, like telegraph wires, put three or four inches apart, are used instead of slats, and no joists

are used, but the wires are stretched tight by a nut on the end. The hops are put on it from a movable walk—a plank two and a half feet above the carpet, supported from the rafters by wire suspension rods—and when the hops are on, the plank is turned on edge. When the hops are dry, the carpet is rolled off by a shaft in the store room, so that all the hops are taken off in less than five minutes, and the carpet put back ready for a new charge, without losing the heat or letting the fires go down. No sweeping is needed with this kiln, nor does any one step on the carpet.

The roof should be carried up very high, so as to have the ventilator as high as possible, and make a better draft to the kiln. This is made with a cowl which turns by the wind, or a slat-ventilator is used, arranged so as to keep out the rain, while the air can pass up freely.

The store room is next the drying room, but the floor is from three to eight feet lower than the carpet, so as to make plenty of room to store hops in bulk until they are ready to press. It should have but one window, which should have a shutter to keep the room dark while the hops are in it. They will turn brown if exposed to light. Have boards to set up, and make the end of the store room furthest from the drying room into one or two large bins, so that any damaged hops can be

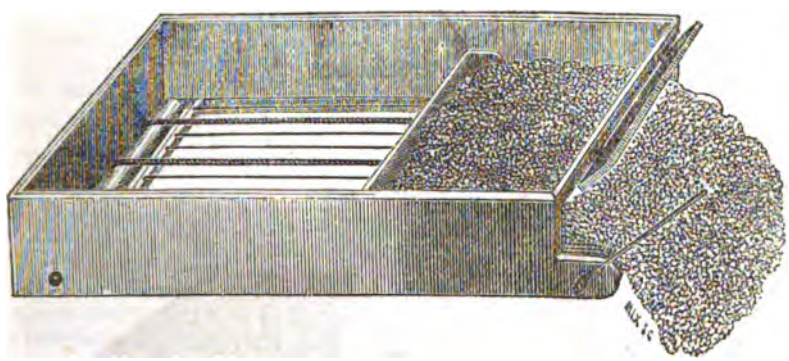


FIG. 10. THE FRANCE KILN IMPROVED.

This represents the floor of the kiln with a different method for moving it. Two cylinders are placed, one at each end of the drying room; the ropes pass over the one furthest from the store room, and are attached to both ends of the carpet. By revolving the cylinder in the store room, the carpet is moved at pleasure. In this plan wires are used instead of slats.

kept separate. Under the store room is the baling room; it has a tight floor, and is used to bale the hops, store the hop-press, together with any tools not in use in the yard.

At first picking put on the hops not more than twelve inches deep, and start the fires. Use only dry wood, as more heat can be had from dry than green wood, and where the stoves are large, the fires last better if large wood is used. Open all the air-holes, so there will be a good draft through the hops. When the fire is first made the steam passes off from the hops very fast. Keep the temperature as regular as possible. About one hundred and eighty degrees, or as near that as may be, with as good a current of air as you can get, will dry them rapidly. After making the second fire, take a pan of coals from the stove and put on a quantity of sulphur. If the hops are nice and free from rust or mold, one pound is enough for bleaching a kiln, but when very rusty from two to five pounds are sometimes used. Put the pan in the center of the room and shut the door. The fire must be well made, for it cannot be mended for half an hour. When half the stems will break on bending them the hops are dry enough. This will be in from eight to ten hours.

In using the common kiln the doors are thrown open, the fire goes down, and the kiln is cooled for two hours, so that a man can go in to shovel off the hops, which he cannot do while it is hot. With a rake, shovel and broom, he throws the hops off upon the cooling floor of the store room, and sweeps the carpet off clean. He must wear shoes without nails, or he will tear the carpet.

Much of the flour, or lupulin, always falls through into the stove room—sometimes two or three pounds from each kiln full. What falls on the stoves and pipe must be brushed off, or it will smoke the next charge. With the France kiln there is no sweeping. The hops are taken off when first dry, no flour falls through, and the hops are left whole; the next charge of hops is put on, and the heat is mostly saved, the fires not being allowed to go down at all. Two men have charge of the drying, where the kiln is run all the time, each working half the time. The hops should be left on the cooling floor, where they are thrown, until the next charge is nearly done; they are then shoved back a little to make room for more, and so on until they get into the bins at the end of the room; two or three charges being in this way kept spread as much as possible all the time.

When the hops have been neglected by the dryer going to sleep, or any other cause, they become too dry, which is known by their feeling harsh, and most of the stems snapping. Shut the air-holes, put a quart or so of salt upon a pan of coals in the stove room, and let the charge stand a short time—this will toughen them. It is best to have pickers enough to keep the kiln running all the time. Be careful to get hops dry enough.

BALING AND PRESSING.—The baling should be done in from four to six weeks; we usually take a rainy time when nothing else can be done, as then hops handle best.

The Harris press is the best I have ever seen for baling hops; it is made by Seneca Gifford, Waterville, Oneida county, New York. It is cheap and good, costing now but fifty dollars. Baling cloth is made on purpose for hops. A good quality should weigh about one and one-half pounds per yard. Never use gunny cloth nor burlaps. Twine for sewing should be small, strong, and free from bunches, so as to sew easily; the needles used are common bent sail-needles. A dozen pointed iron skewers are wanted to hold the cloth while sewing. Use tallow instead of wax upon the thread, so that it will slip easily.

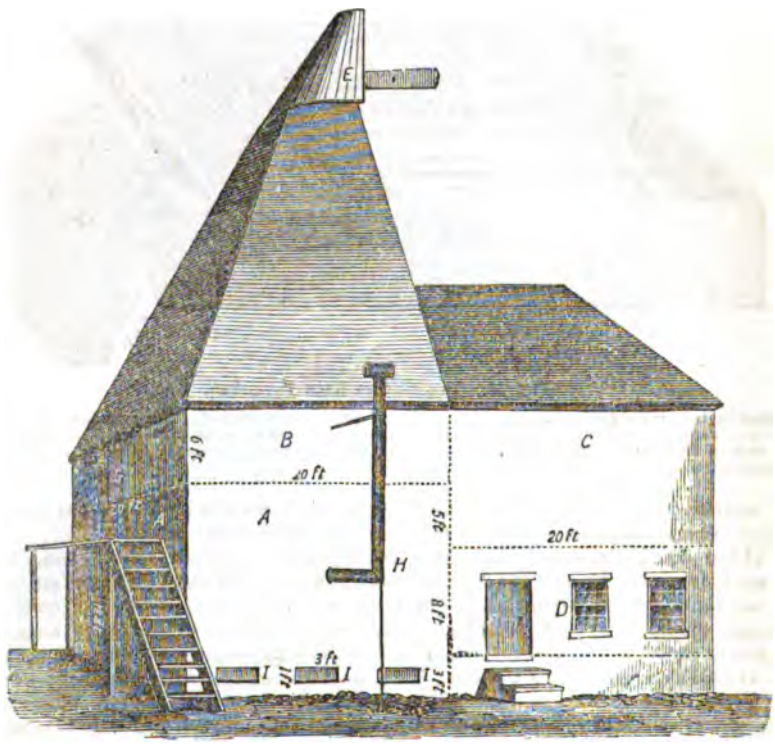


FIG. 11. DRAFT HOP-KILN.

The figures give the dimensions, and the letters indicate the same parts as in Fig. 6.

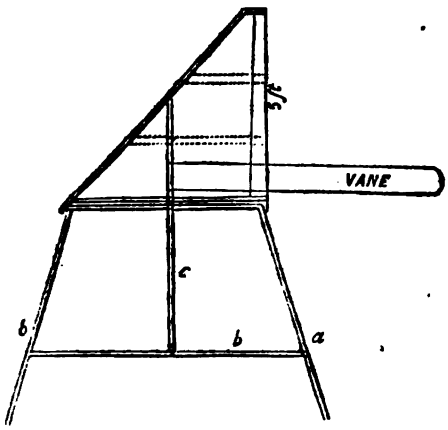


FIG. 12. SECTION OF COWL TO DRAFT-KILN.

a, continuation of roof. *b*, 3x5 joist framed into rafters of roof. *c*, post, 3x3, framed into cowl and movable upon an iron pin at bottom, which rests on *b*. The cowl shuts over the termination of the roof, and projects over it about two inches.

Cut the sacking for the bottom piece one yard longer than the bottom of the press, and the upper one six inches shorter; save one peice of each kind until the last bale, for a measure, so as to have them all uniform. When a nice hop is grown, it should be kept as whole as possible. Have side-boards to fit it from the top of the press to a trap-door in the floor of the store room, and a wooden box there of the same size to shovel them into. The side-boards to come out when the hops are below them. Take care to fill the corners of the bale full, so as to make a square, handsome package. Bales are all the same size, weighing from one hundred and fifty to two hundred and forty pounds, according to the degree they are pressed and how well seeded they are. The baled hops, if kept stored long, must be, in a dry room, set on end, and a few inches apart, so that the air can circulate between them.

SELLING.—When hops are high, almost any will sell; but when they are low, only the best sell readily. At two years old they are worth but half price, and are worthless at four or five years. Always sell the first year. By keeping the run of the market, both in this country and Europe, the grower can form an intelligent opinion of what the price should be. It varies from eight cents, at the lowest, up to fifty or sixty cents, as at present, for very fine qualities; but the average for the last forty years has been seventeen to eighteen cents. The cost of raising in the manner described is from four to six cents per pound. The average crop all through the country is near one thousand pounds per acre (when the work is well done), but I have seen twenty-five hundred pounds per acre raised on a large yard. On two large yards in Morris, Otsego county, New York, the average for four years past has been seventeen hundred on one, and eighteen hundred on the other, being both trained on strings.

INSECTS.—For two years past, the hop crop has been very much injured, even ruined in some places, in New York, by the hop louse. This comes early in July, and unless prevented it increases until it ruins the crop. I insert, from Harris's Insects Injurious to Vegetation, a part of the description: "The winged plant lice provide for a succession of their race by stocking the plant with eggs in the autumn; these are hatched in due time in the spring, and the young lice immediately begin to pump up sap from the tender leaves and shoots, increase in size, and in a short time come to maturity; in this state it is found that the brood, without a single exception, are females, which are wingless, but are in a condition to continue their kind immediately. Their young, however, are not hatched from eggs, but are produced alive; and each female may be the mother of fifteen or twenty young lice in a single day. The plant lice of this second generation are also wingless females, which grow up and have their young in due season, and thus brood after brood is produced, even to the seventh generation or more, without the appearance or intervention of a single male through the whole season. This extraordinary kind of propagation ends in the autumn with the birth of a brood of males and females, which, in due time, acquire wings, and pair. Eggs are then laid by the females, and with the death of these winged individuals, which soon follows, the species becomes extinct for the season."

The bark of poles, and any old rubbish, vines, etc., in the hop-yard, will be covered with the eggs of these plant lice. When sawed stakes are used, and coated with gas tar, not an egg will be laid on them. The old vines should always be burned up in the fall.

The enemies of the louse are the lady-bug (coccinella), while in the larva state. It is a small flattened grub, of a bluish color, usually spotted with red or yellow, and has six legs near the fore part of the body; "they are hatched from yellow eggs laid among the lice in clusters." Another is the grub of a "golden eyed, lace-winged fly;" "it is a long slender grub, with a pair of large, curved, sharp teeth." Harris says it will kill one louse a minute. "Its eggs are on short hairs among the lice." "Small two-winged flies, black, with yellow bands, lay their eggs among the lice; they make maggots which destroy large numbers."

By taking care to save what are found of these, I think the lice will be kept down so as not to ruin yards, as is done in some cases now. Every hop-grower should have Harris's book. The insects which prey on his crops are described there, with some hints toward their extermination. Ants should be kept out of the yard as much as possible; they are said to take care of the lice, while they are few, and transport them to vines where there are none. Drive away, by coal oil or gas tar put on their hills. After the first year, lady-bugs and other enemies of the lice increase so much as to save the yard from much damage. There are several caterpillars which live on the hop-vines, but I have never seen them plenty enough to do much damage, except the one which lives in the ground and eats the roots and the vine near the surface.

If the grower examines the hop-yard closely, he will soon learn to tell his enemies from his friends. Crows and other birds are of great use in eating beetles and grubs, and snakes also devour large numbers of them. Last spring, I found more than half the hills in our yard dug into by skunks, searching for grubs, and where they had been I could find no grubs. The little harm they do in sucking eggs is far more than made up by their work. A family of skunks will do as much toward taking out grubs, if you will protect them from the dogs, as a man can do. They work in the night. Barn swallows were on our yard last summer all the time, and appeared to live there, going only from the barn to the yard, where they got their whole living.

MANURING.—Every fall the yard should have two forkfuls of coarse manure on top of the hills, partly as a protection to the vine, and from the first to the middle of July it should have as much, or, if the ground is poor, more well-rotted, fine manure, which has been fermented enough to kill any seeds which were in it. This should be put on, and covered immediately with an inch or two of dirt; ashes are often mixed with the manure, but I prefer using them with lime on the surface of the ground. I have seen plaster used with good effect. Old bones are good to bury in the yard, where any amount of them can be had. So also are the sweepings of blacksmiths' shops. In this country, hops are now mostly raised in central New York, some in New England, and a few in the western states. I have seen them growing wild in Iowa, Missouri and Kansas, fully as fine as the cultivated ones. They grow wild on all creek bottoms, where the soil is not overflowed in the winter, and where they are not killed by fire, producing best in those bottoms formed by the wash of limestone hills. The few yards which have been established in the states of Iowa and Wisconsin produce large crops of the best quality of hops.

THE TOBACCO CROP is an important one in this state. The quality of the crop this year is thought to be very fine. Quite a large number have turned their attention, within the past season, to the cultivation of this crop for the first time or in larger extent than heretofore, and it is believed that the amount produced in the state this year will not fall short of the previous year, though it has been estimated much less by dealers. The yield in Missouri, in 1860, was 25,086,196 pounds, and in 1863, over 26,000,000. In 1864, the yield was 25,051,300, and in 1865, it was 18,800,000. This year it has been estimated at 10,000 to 15,000 hogsheads, which is probably much too low.*

Tobacco growers have found the crop a very profitable one for several years past, which has stimulated many others to plant it, and given rise to considerable anxiety for information in regard to the best method of culture and management. We are glad to be able to place in the hands of the farmers this year the very excellent article on the subject, which will be found in the following pages. It is written by one who has learned from his own experience as well as from the practice of others. It will be seen that a fine crop of tobacco can only be obtained at the cost of great care and vigilance.

*A later estimate by the secretary of the chamber of commerce makes it the same as 1865.

DOTY'S CLOTHES AND WOOL WASHER.

The agents of this machine claim that it is superior to all others in the following respects:

1. It is small. It occupies but about 20 by 25 inches space, yet has capacity for five or six shirts, three sheets, or that amount of other articles.

2. It is easier worked. A feeble woman may sit down to use it; a little girl may stand and do it.

3. It secures all the benefits of using suds boiling hot, and shutting in the steam. The hand does not touch the water in washing; nor in wringing if the universal clothes wringer is used.

4. Hence it finishes its work in the shortest possible time, two to four minutes being sufficient to cleanse each batch.

5. It operates on the fulling mill principle of pushing the mass together, which rolls slightly and receives each impression in a new place, thus doing its work without the slightest injury to the garment.

6. It will wash wool fleeces at the rate of one in two minutes without tearing them apart, and the wool brings the price of tub-washed wool, which is five to eight cents per pound more than that washed on the sheep.

7. It may be attached to a common churn dash, and the churning done with ease in a sitting posture.

8. It is cheap. Its price leaves it within reach of almost every family; and as it soon pays back its cost in the saving of garments, every family can better afford to buy one than to supply itself with the goods worn out for the want of one.

9. It does the whole work—washing, rinsing and blueing, without the use of either washtub or washboard.

The secret of success with this washer, and, probably, also with most other washing machines is that they allow the use of boiling hot soap suds, by which the dirt is softened and grease dissolved. An advantage which the Doty machine has over some others is that there is no rubbing of the clothes; they are rinsed by beating and squeezing them together in the hot suds by means of the handle above the machine, aided by coiled springs, and thus the wear of clothes and rubbing off of buttons is saved.

There is probably no labor saving implement more needed or desirable, or that would pay better for the money invested, than a good washing machine in the families of Missouri farmers. In former times when

servants were plenty the need was not so great, though it would have been good economy even then. It is better to buy a washing machine than to buy clothes to be rubbed to fragments on a washboard. It is better to buy a washing machine which will do in two or three hours what would have been a hard day's work by hand. In the report of last year we noticed this subject, and presented a cut of the "Queen of the West" washing machine, which we had not used. This year we present a cut of the Doty machine, which has been used in our family for the past six or eight months, and our "better half" thinks it is one of the best investments we have ever made.

Among the many washing machines invented but few have been successful, and we believe that we are doing a favor to our farmers, not less than to their wives and daughters, by inviting attention to this machine, which we know is successful and within the means of all.

L. D. MORSE, *Corresponding Secretary.*

GENERAL CONDITION OF AGRICULTURE.

FIRST SERIES.

[From the Missouri Statistical Report.]

COUNTIES AND REPORTERS.	GRAIN CROPS, ETC.	REMARKS.
Audrain ..... O. A. A. Gardiner.	Wheat, average crop fifteen bushels per acre; corn, fifty bushels; rye, oats and buckwheat not reported.	Face of the country lies on the "divide" between the Mississippi and Missouri rivers; consists mostly of dry, rolling prairie; timber in belts along the banks of streams.
Bates..... B. H. Thornton.	Wheat, average crop fifteen to twenty bushels; no report for this year; corn, average crop, fifty bushels; rye, oats, barley and buckwheat, not much cultivated.	Face of the country mostly prairie; timber in belts along the streams.
Callaway ..... H. Burt.	Wheat, not much cultivated, average yield ten to fifteen bushels; corn, fifty; rye, twenty bushels, not much cultivated; buckwheat, little grown; oats; largely, average, twenty bushels.	Face of the country about one-third prairie; plenty of timber; not very well watered.
Cape Girardeau..... A. H. M. Williams.	Wheat is a leading crop, average fifteen bushels; corn, about fifty-five bushels; rye, but little grown; buckwheat, barley, oats, average about thirty-five bushels.	Situated on the Mississippi river; face of the country hilly and swampy; well watered; one of the oldest counties in the state.
Cass .. .. G. C. Broadhead.	Wheat, fifteen to twenty bushels to the acre; corn, thirty to sixty bushels; rye, oats and buckwheat, no report.	Face of the country rolling and gently undulating; a fine stock-raising county.
Clark ..... J. T. Caldwell.	Fall wheat almost a failure, winter-killed; spring wheat, an average crop.	Face of the country rolling, well watered; soil good.
DeKalb..... A. M. Chesmon.	Wheat, average crop twenty-five bushels; corn, from thirty to sixty bushels; corn is the principal crop.	Face of the country high, rolling prairie; soil good, well watered.
Franklin.....	Report not complete.....	Face of the country mountainous; soil good for pasturage, well watered; one-third prairie; timber plenty.
Greene..... M. J. Hubble.	Wheat, about 130,000 bushels raised last year; corn, 1,000,000 bushels; barley and buckwheat raised to a small extent, yielding about twenty bushels to the acre.	
Grundy.....	Wheat, average crop six bushels; corn, thirty-five; oats, twenty-five to thirty bushels; rye, very little raised, but is considered a sure crop; barley, none raised; buckwheat, very little.	Face of the country divided into two parts, high rolling prairie and intervals along the rivers.
Hickory ..... R. B. Runyan.	Wheat, average crop twenty bushels, corn, forty bushels; oats, twenty bushels; barley and rye, not reported.	Face of the country hilly soil, limestone with clay subsoil, well watered.
Jefferson..... W. S. Jewett.	Wheat, average crop twelve bushels, not much grown; corn, twenty-five bushels; rye, grown only for pasturage; oats and barley, not reported.	Face of the country rough; soil various; chiefly a mining county.

GENERAL CONDITION OF AGRICULTURE—CONTINUED.

COUNTIES AND REPORTERS.	GRAIN CROPS, ETC.	REMARKS.
Johnson ..... B. Hornsby.	Wheat, this year, a little less than an average; other crops not reported.	Face of the country mostly rolling prairie, fine for stock growing as well as cultivation.
Holt..... G. Meyer.	Wheat, average crop fifteen bushels.	Face of the country diversified and undulating; bottoms along the rivers level, soil good, well watered.
Knox..... W. M. Beal.	Wheat is not much cultivated; corn does well when well cultivated, average crop thirty bushels, with good cultivation fifty bushels; rye and oats grow well, but for want of a good market but little cultivated.	Face of the country rolling prairie with belts of timber along the streams; well watered.
Lafayette..... W. W. Gaunt.	Wheat, average crop thirty bushels, crop of '65 uncommonly good, often forty bushels to the acre; corn always yields large crops; rye, oats, barley, also.	Face of the country mostly prairie; soil rich, well watered; timber along the streams.
Livingston..... J. H. Drake.	Wheat, average crop twenty bushels; oats is a favorite crop; average, forty bushels, corn, the same; rye, about thirty bushels; buckwheat, forty bushels.	Face of the country mostly rolling prairie; timber along the streams; well watered.
Franklin..... D. W. Whitney.	Wheat, average crop ten bushels, fine quality; corn, average thirty-five bushels; oats grow well; rye, buckwheat and potatoes raised in small quantities; barley only to supply local business; sorghum for domestic use.	Face of the country hilly; clay soil on the hills; along the bottom a rich loamy soil; well timbered; and plenty of springs, hard water.
New Madrid..... T. L. Fontaine.	Wheat, three-quarters average crop; corn, do.; not much wheat raised for want of mills; oats not much raised; no flax, hemp nor tobacco; castor beans first raised this year.	Face of the country level; soil, black sandy loam, very fertile.
Platte	Wheat, average crop twenty bushels; corn, forty; oats, thirty; rye, forty; barley, forty; potatoes, eighty; tobacco, eighteen pounds; sorghum cultivated only for home consumption.	Face of the country rolling; soil rich, well adapted to the raising of grain; timber along the banks of streams: good stone for building; not much coal.
Oregon..... J. H. Woodside.	Wheat, average crop fifteen bushels; corn, forty; oats, thirty; rye not much cultivated.	Face of the country uneven and broken, with good soil in the valleys, well timbered and good water.
Osage ..... L. Philbert.	Wheat, average crop fifteen bushels; corn, forty; rye is very little cultivated, mostly for winter pasturage; oats yielded about thirty bushels.	Face of the country broken; well timbered in the northern part; in the southern, only along the rivers.
Shelby ..... T. Butterworth.	Wheat is not much raised; corn is the principal crop; rye but little raised; oats less than in former years.	Face of the country agreeably diversified; timber and prairie in about equal quantities.
Scott..... R. B. Wade.	Wheat, average ten bushels; corn, thirty-three bushels; rye is sown chiefly for pasturage; oats and barley, average thirty bushels.	Face of the country high and rolling, well watered and heavily timbered.
Vernon ..... A. Badger.	Wheat, average twenty bushels; corn, forty; rye, oats and buckwheat grow well when cultivated.	Face of the country high rolling prairie, with timber along the streams; well watered; well adapted to sheep raising.
Webster ..... R. J. Bodenhamer.	Wheat, average crop fifteen bushels; corn and oats about forty bushels.	Face of the country hilly; rich valleys along the streams; well watered.
Jackson ..... B. D. Dawson.	Wheat, average crop thirty bushels; corn, fifty; and all small grains produce well when cultivated.	Face of the country high rolling prairie; timbered along the streams.

CHARACTER OF THE SEASON AND CONDITION OF AGRICULTURE, 1866.

SECOND SERIES.

COUNTIES.	CHARACTER OF THE SPRING.	SUMMER.	AUTUMN.	CHARACTER OF CROPS OF FRUIT.	CULTIVATION OF GRAPES.	CONDITION OF FRUIT CULTIVATION.	GRAIN CROPS, ETC.
Audrain	Cold & late.	Dry	Wet.	Apples, half crop; grapes, winter killed; pears, half crop.	Not much cultivated	Increasing	Crops half as large as in 1865.
Callaway	Wet	Dry and hot.	Pleasant	Light; peaches, killed in February; apples, few.	Not much cultivated; affected by rot or blight.	Increasing	Generally light.
Cooper	Rather cold.	Unusually dry.	Dry, except the latter part.	Apples, peaches and pears poor crop; grapes good.	Grapes largely cultivated and increasing.	Increasing rapidly, and pays well.	Grain crops not near as good as last year.
Cedar	Wet and cold	Dry	Rainy	Apples, good; peaches, half crop; pears, do.	None cultivated; wild, plenty.		Corn, average crop; wheat, over average; oats and hay, average; vegetables, over average.
Clinton	Favorable	First favorable; dry.	Favorable	Not abundant	Suffered from blight.	Increasing	Abundant.
Cole	As usual	First favorable, then dry.	Favorable	Not full crops	Few cultivated; failed	Incr'sing rapidly	Twenty per cent. above last year.
Boone	Wet and cold	Dry and hot.	Mild and favorable.	Apples, quantity fair, quality inferior; pears and peaches, half crop.	Not cultivated		Corn and wheat half crop; oats, fifty per cent. more than usual.
Greene				Fruit abundant; apples, extremely fine.	Not much cultivated	Increasing	Corn, half crop; wheat better; rye, oats and barley about the same as usual.
Gentry	Wet	Dry	Warm	Apples, half crop; too cold for peaches.	Just being introduced; wild grapes abundant.		Corn, half crop; hay, good; potatoes, half crop.
Iron	Warm and early.	Pleasant and dry.	Warm and wet.	Apples, by moth; pears, good; peaches full crop.			Corn, short crop; wheat good; hay, plenty.
Lawrence	Wet and cool	Dry & warm.	Delightful	Apples, average; pears, not average; peaches, do.; cherries, average; wild grapes, not average.	Not much cultivated	Increasing	Corn, not average; oats, average; hay, not average; vegetables, not average.
Osage	Wet; last part of the seas'n dry.	Wet		Fruit crop, quality good; quantity about half.	Not very good	Increasing	Corn, half crop; wheat, fair, good quality; oats and barley, do.
Perry	Moist	Early part dry, latter favorable.	Pleasant	Fruit, large crop	Not much cultivated	Increasing	Hay, good; wheat, do.; corn, oats and barley above average.

CHARACTER OF THE SEASON AND CONDITION OF AGRICULTURE, 1866—CONTINUED.

COUNTIES.	CHARACTER OF THE SPRING.	SUMMER.	AUTUMN.	CHARACTER OF CROPS OF FRUIT.	CULTIVATION OF GRAPES.	CONDITION OF FRUIT CULTIVATION.	GRAIN CROPS, ETC.
Phelps.....	Wet.	Dry	Pleasant.....	Peaches, fair crop; apples, do.; pears, few cultivated.	Grow well and free from blight.	Increasing	Corn, wheat, barley, oats, full average.
Randolph....	Wet.	Dry and cool	Pleasant.....	Fruit crops, average.....	No vineyards.....	Not perceptibly increasing.	Grain crop, average; vegetables, good; potatoes especially fine.
Hickory	Wet	Cool.....	Wet	Fruit, average.....	Not cultivated.....	Increasing	Wheat, good; corn, half crop; oats, barley and vegetables, fair average.
Johnson.....	Wet and cool	First part wet; last, dry & hot.	Wet	Apples, good crop; peaches, a failure.	Not cultivated.....	Increasing	Good crops of all kinds of grain.
Livingston ..	Early and warm.	Hot and dry.	Dry	Apples and pears, good; peaches, a failure.	Few cultivated; quality good.	Increasing	Wheat, oats, rye and hay, full average.
Ray	Average	.....	.....	Fruit crop, short; no peaches; grapes, light crop.	Not much cultivated.....	Increasing	Corn, not average; wheat, very fine; oats, small crop; hay, very fine.
Scotland	Cold and wet	Pleasant.....	Cool.....	Apples, good crop; no peaches; few grapes.	Not much cultivated.....	Incr'sing rapidly	Corn, half crop; oats, abundant; hay, about average; wheat, not much cultivated.
Shelby.....	Rather late..	Dry.....	Wet	Fruit good, except peaches.	Not much cultivated.....	Increasing	Corn, large in quantity, but bad in quality; wheat and oats little raised; hay, good.
St. Louis.....	Rather late; generally favorable.	First, rather dry; latter half, wet.	Wet at first, then dry.	Fruit crop deficient and inferior; apples, half crop; peaches, half; grape, three-quarters, except Catawbas.	A good many cultivated..	Fifty per cent. more this season than ever before.	Corn, seven-eighths crop, quality soft; wheat, very good, three-quarters crop; oats, fair; hay, very good; damage by insects increasing every year.
Marion	Fav'able for early planting.	Average	Wet.	Fruit crop a failure; grape, below average.	Is considered a paying crop.	This year double as many trees planted as last year.	Corn, above average; hay, nearly double the average; potatoes, crop comparative failure; hemp, average one thousand pounds to the acre.
Knox.....	Wet and cold	Average.	Average.....	Fruit crop cut short by late frosts in the spring.	Rather cold for grape; when the vine is covered, does well.	Incr'sing, especially apples.	Corn, crop not good; hay, abundant; crops generally above average; vegetables, extra fine.
Clark	Cool and backward.	Favorable....	Sept. cold & wet; frost Sept. 21, latter part favorable.	Apples, full crop, except when injured by worms; fruit generally good.	Few planted; above half crop.	Increasing	Corn crop, light; wheat, little sown; spring wheat, extra fine; oats, good, the best for two years; hay, do., crop not quite so good as last year.

Putnam	Wet and cold	Pleasant	Pleasant	Fruit crop good; peaches, few raised.	Not much cultivated	Increasing	Corn crop, rather poor; wheat and oats, best for two years; season generally unfavorable for vegetables.
St. Clair	Wet and cold	Pleasant	Pleasant	Fruit, good crop	Few cultivated	Increasing rapidly.	Early planted corn did well; late, light crop, cut off by frost; wheat rather above average; hay, good.
DeKalb	Early, dry; latter, wet.	Early part wet.	Very wet	Fruit crop light; orchards rather scarce.	Not much cultivated	Increasing	Crops, average.
Franklin				Hitherto little raised; peaches very sure crop.	Extensively cultivated	Increasing	
Harrison	Favorable.	Wet	Wet	Apples half crop; peaches very uncertain; pears not raised.	Just beginning to be cultivated; grow well.	Increasing	Wheat, oats and grass fifty per cent. above average; corn comparative failures, poor quality.
Monroe	Cold and late.	Dry	Wet	Apples half crop			Season generally unfavorable for corn and wheat; oats and hay fine.
Gasconade				Fruit crops small; apples one-half; peaches one-tenth; pears one-half; grapes three-fourths of a crop.	Grapes are cultivated a good deal; did not suffer much from blight.	Rapidly increasing.	Total production of vineyards fifty thousand gallons of wine and forty thousand dollars' worth of plants.
New Madrid	Clear, open weather.	Dry and warm.	Wet and cool	Fruit crop light; no peaches; few apples; trees troubled with blight.	Grapes but little cultivated; suffer by rot and blight.	Cultivation of fruits increasing; grapes neglected.	Crops generally not more than three-fourths average; some castor beans raised; cotton does well.

PHYSICAL GEOGRAPHY OF MISSOURI.*

BOUNDARIES AND AREA.

The State of Missouri lies between 30° and 40° 80′ north latitude, and between 11° 45′ and 18° 50′ west longitude. It is bounded on the north by Iowa; on the east by Illinois, Kentucky and Tennessee; on the south by Arkansas, and on the west by Indian territory, Kansas and Nebraska, including an area of 65,000 square miles.

FACE OF THE COUNTRY.

At a period away back in the geological ages some subterraneous force pushed up through the crust of the earth a series of knobs and irregular ridges and hills in a region extending from Ste. Genevieve, in a southwest direction, to Shannon and Texas counties, covering some portions of Madison, St. Francois, Washington, Iron and Reynolds counties. After this, these knobs and ridges were islands in the ocean which covered the state. On the bottom of this ocean the consolidated strata of limestone, sandstone and other rocks were formed. In the course of events the country was raised above the ocean, and the surface presented a broad undulating plateau, from which projected the hills and ridges above named. The rains descended upon this plateau, and the waters collected into branches, creeks and rivers, and flowed away to the ocean, as now, and during the succeeding cycles the channels and valleys of the streams were worn into the rocks as they now appear.

These facts respecting the formation of our state give us a good idea of the surface of the country. It may be described as a broad undulating table land, or plateau, from which project a series of hills and ridges, extending from Ste. Genevieve to the southwest, and into which the branches, creeks and rivers have worn their deep, broad channels and valleys. Besides the local undulations in this plateau, some portions of it are much higher than others, as indicated by the course of the streams. In that portion of the state north of the Missouri river the northwest part is the highest, and there is a general

*From the unpublished notes of the geological survey.

descent to the south and east. The streams show the descent to the south very distinctly, and though they do not show so decided a descent to the east, the railroad surveys show that the Mississippi river is some three hundred feet lower than the Missouri in the same latitude. The Missouri at Weston is three hundred and twenty feet higher than the Mississippi at Hannibal. There is also a high region extending along the line of the North Missouri railroad, from Montgomery to the state line in Schuyler.

The highest part, south of the Missouri, is a high divide extending from Greene county through Webster, Wright, Texas, Dent, Iron and St. Francois counties. The western part of this high region is a broad, rolling table land, but the eastern end is broken into numerous knobs, hills and ridges, as seen at Pilot Knob. From these highlands the waters descend in all directions; on the south to the White river and the Arkansas; on the west to the Neosho; on the north to the Missouri and the Meramec; and on the east to the Mississippi. There is another region much less elevated, extending from Cole county westward to Cass, and dividing the waters of the Osage and the Missouri.

The elevation of the following places will give a general idea of the surface in this part of the state. The figures are the elevations above tide water in Mobile bay:

St. Louis directrix	372	feet.
Base of Pilot Knob	909	"
Top of Pilot Knob	1490	"
Marshfield, in Webster county	1462	"
New Madrid	247	"
Ohio City	272	"
Granby, Newton county	1030	"

By these altitudes it will be observed that the top of Pilot Knob, on the eastern end of the above named highlands, is only twenty-eight feet higher than Webster on the table lands of the western end. Ohio City, at the mouth of the Ohio, is one hundred feet below St. Louis.

Besides these general irregularities of the surface, there are numerous undulations which give the country its rolling character, and numerous valleys and ravines, which render it more or less rough and broken. These valleys, worn by the streams, are an important feature in the physical structure of the state, as they have a material influence on the climate, and give us vast quantities of the very best bottom lands.

The valleys of the large rivers vary in width from two miles to ten, while those of the smaller streams are proportionally narrower.

NAVIGABLE WATERS.

The Mississippi washes the entire eastern border of the state a distance of five hundred miles. The Missouri washes the western boundary from the northwest corner, southward some two hundred

and fifty miles to the mouth of the Kansas, whence it takes a course south of east, through the heart of the state, to its junction with the Mississippi, a distance of nearly four hundred miles.

Besides these two mighty streams, they have many tributaries within the state which are more or less navigable for steamboats, keel-boats and barges. On the right bank of the Missouri the Gasconade, the Osage and the LaMine are navigable. The lumber business of the Gasconade makes its navigation a matter of importance. The trade of the towns on the Osage has induced steamers to make regular trips as high as Warsaw. Barges and keel-boats might pass up as high as the state line. There is no business to call boats up the LaMine, even the short distance its waters are navigable.

On the left bank the Platte, the Chariton and Grand river are navigable for keel-boats and barges, and even steamers have made some few trips on their waters. The DesMoines, Salt river and the Meramec, the St. Francois and White rivers, have been navigated by steamers on a few important occasions. Barges might be used on all of these and several other streams for the transportation of merchandise and the products of the country on their shores.

SMALLER STREAMS.

There are a vast number of smaller streams, such as are called rivers, creeks and branches. A glance at the map will show how well these are distributed over the entire surface, and supply an abundance of water to all parts of the state.

SPRINGS.

No country is better supplied with bold springs of pure waters. Out of the bottoms there is scarcely a section of land but has one or more perennial springs of good water. Many of these springs are large even beyond the conception of those who have not seen the rivers which flow from them, and drive the mills and machinery placed upon their waters. One may serve as a sample. Bryce's spring, on the Niangua, discharges 10,927,872 cubic feet of water per diem, drives a large flouring mill, and flows away a river forty-two yards in width. These vast springs are very numerous in the south part of the state.

SALT SPRINGS

Are very abundant in the central part of the state. These springs are large and numerous, and discharge vast quantities of excellent brine, in Cooper, Saline, Howard, and the adjoining counties. These brines are near the navigable waters of the Missouri, in the midst of an abundance of wood and coal, and might furnish salt enough to supply all the market of the continent.

SULPHUR SPRINGS

Are also numerous and more generally diffused throughout the state. The Chouteau springs, in Cooper, the Monagan springs, in St. Clair, the Elk springs, in Pike, and the Cheltenham springs, St. Louis county, have acquired considerable reputation as salubrious waters, and have become places of popular resort. There are good sulphur springs in at least half the counties in the state, and the waters of the most of them are good, and similar to the waters of the Chouteau and the Elk springs.

CHALYBEATE SPRINGS.

There are a great many springs in the state which are impregnated with some of the salts of iron. Those containing carbonates and sulphates are most abundant; some of these have acquired some considerable reputation as medicinal waters. Sweet springs, on the Black water, are perhaps the most popular and valuable of the kind in the state.

PETROLEUM SPRINGS.

Tar springs, as they are called, are found in Carroll, Ray, Randolph, Cass, Lafayette, Bates, Vernon, and other counties of the state. Many of these springs discharge considerable quantities of oil. The variety called lubricating oil is the more common. It is impossible to say, with certainty, whether petroleum will be found in paying quantities in these localities; but the fact that it has been flowing from springs in such quantities would indicate some abundant source; and there is scarcely a doubt that there are reservoirs of considerable quantities. Where these reservoirs are, no one can tell with certainty, and all explorations must be undertaken in a considerable degree of uncertainty; and the fact that a few holes have been bored at any given locality without finding these reservoirs, do not prove their non-existence. In this, as in all other oil regions, boring is a matter of chance. Not more than one hole in fifty has been successful, even in the most favored regions, and yet the vast wealth obtained by the few fortunate has induced the many to invest in the uncertain business.

WATER POWER.

Though steam has to a great extent been substituted for water in driving machinery, a good water power is still valuable for many purposes, especially in new rural communities. There are places in all our streams, save the Mississippi and Missouri, where they might be dammed and made to drive the machinery of mills and factories. Such places are most numerous in the south part of the state, where the streams have rock beds to support the dams and make them permanent. I have noticed excellent localities of the kind on the Osage,

Niangua, Pomme de Lerre, Sac, Spring river, Big river, Castor, Meramec, Bourbeuse, Gasconade, Currant river, White river, Grand river, LaMine, etc. But the most valuable water powers are the large springs, which are so abundant throughout nearly all the counties in the southern part of the state.

Many of these springs are now used to drive mills of various kinds. They are particularly abundant on the waters of the Meramec, Gasconade, Bourbeuse, Osage, Niangua, Spring, White, Sugar, Big, Currant, Little and Black rivers.

No water powers can excel that at Bryce's spring, on the Niangua. It discharges about 11,000,000 cubic feet of water per diem, with no perceptible variation of temperature or quantity. The temperature is about sixty degrees F., so warm that no ice forms in it to obstruct the machinery; and the quantity so regular that the machinist may know how much power it will exert each moment from the beginning to the end of the year, and can construct his dams and machinery economically, with just enough strength to meet the necessities of the case; whereas in streams, the uncertain rise and fall of the water and the ice are sources of great loss and annoyance.

There are hundreds of these springs sufficiently large to drive mills and factories; and the time is not far distant when these vast limpid fountains will make a thousand burrs and saws whirl and dance to their dashing music.

PRAIRIES.

When the country emerged from the waters which last covered it the marls of the bluff formation occupied nearly all the surface of the state, and a rank vegetation of grasses and other plants sprang up, forming one vast prairie. Young trees grew with the other vegetation, but the fires which overran the country killed them out on the dryer and richer portions. They grew apace, where the fires were too weak, by reason of water or a scarcity of vegetation, to destroy them. As the forests increased in size, they acquired power to withstand and check the fires, and thus they have gradually encroached upon the prairie, until more than one-half of the state is covered by our magnificent forests.

If a line be drawn from Hannibal to the southwest corner of the state, nearly all that portion to the northwest of the line will be prairie, and that on the southeast of it will be timber.

Large areas of timber skirt the streams and cover portions of the uplands on the prairie side; and longs arms of the prairie extend along the divides into the timbered side, as from Macon down along the North Missouri railroad to St. Charles; from Cass eastward along the Pacific railroad to Cole; and from Newton up along the highlands through Greene to Webster and eastward; and small patches of it checker the whole timbered region, even to the swamps of the southeast.

The bottom prairies are level, and often sublime in their vast extent; while upland prairies are rolling and grand in their endless succession of undulation, like the ocean subsiding from the effects of a storm.

TIMBER.

I herewith furnish you a descriptive catalogue of the trees, shrubs and vines of the state for the agricultural report, from which it will be seen that there is an abundance of the very best kinds of lumber, and that the useful varieties are as well distributed as in any portion of the Union.

Pine, walnut, cherry, ash, maple, birch, hickory, oak, linden, cottonwood, poplar, sweet, black and yellow gum, cedar, cypress, sycamore, locust, coffee-tree, elm, pecan, chesnut, tulip-tree (the "white and yellow poplar" of Kentucky and southern Missouri), beech, willow, hackberry, mulberry, tupelo, catalpa, iron-wood, hornbeam and box-elder, are found in great abundance in the state, and many of them in all their known varieties. There are six species of hickory, three of locust, eighteen of oak, and varieties of other trees in like proportion.

All these kinds of trees grow very large in our deep rich soils and our warm climate. The following, selected from the catalogue, I send you for the agricultural report, will give an idea of the vast size to which these trees grow in our state:

Sycamores, 130 feet high and 43 feet in circumference; oaks, 100 feet high and 29 feet in circumference; cypress, 130 feet high and 29 feet in circumference; walnuts, 110 feet high and 22 feet in circumference.

But no figures, no descriptions, can give an idea of the grandeur and glorious beauty of our forests. Like Niagara, they must be seen, examined from above and below, and re-examined, visited and revisited, before they can be fully appreciated. One must walk in the midst of these mighty monarchs of the forest, until he feels like a pigmy among giants; and must admire the grape vines hanging like huge cables from their lofty branches, and mingling their purple clusters with the highest foliage; and the large orange flowers of the trumpet creeper, and the crimson foliage of the American ivy, warming and beautifying their somber shades; he must see these glories before he can appreciate their sublime beauty and grandeur.

Here, too, the utilitarian can finds woods suitable for all the useful purposes to which they are applied. Oak, hickory, maple, ash, mulberry, locust, linden, poplar, elm, walnut and pine, for carriages, wagons and agricultural implements; pine, linden, poplar, cottonwood, walnut, cypress, cedar, oak and gum, for houses and other buildings; walnut, poplar, linden, maple, cherry, coffee-tree, locust, gum, mulberry, tupelo, pine, cypress, cedar, birch, hickory and oak, for cabinet work; cedar, locust, oak, hickory, mulberry and pine, for fences; and Osage orange, thorns, buckthorns and cedar, for hedges. Millions of

these varieties of lumber are destroyed every year in opening farms; and meanwhile we are importing millions in furniture and agricultural implements, and lumber for the various kinds of carpentry. There is poor economy in importing walnut, pine, cherry, poplar, birch, maple, oak, linden and cedar, manufactured into furniture, from the Ohio and its tributaries, when we are destroying upon our farms more and better lumber of the same varieties every year.

While the Europeans are cultivating their forest trees and using their beautiful woods for their finest furniture, we are sending to Honduras and both Indies for woods to make our chairs and tables. While we are compelled to pay quadruple tribute to the iron, woolen, cotton, silk, linen, shoe, hat, cap and glove manufacturers of Europe and the east, let us have the manhood, at least, to manufacture our own lumber, and make our own chairs and plows and wooden spoons.

GEOLOGY.

The geology of Missouri presents a great variety of rocks and useful minerals. Ever since the early Spanish and French adventurers came to our borders, Missouri has been famous for her mineral wealth. Though Whiteny disparaged our veins of lead and copper; though Daddow has demolished our iron mountains and scratched out our coalbeds; and though our geologists and chemists have found an abundance of gold and platinum, which nobody loves well enough to work, still our mines of lead and copper and cobalt and nickle are yielding up their shining ores; our iron mountains still stand upon their molten bases, and our vast coalbeds still sleep beneath our broad prairies for the drill and pick of some live people to summon them forth to warm, serve and make the nation rich.

The following geological systems are found in the state:

I. *Quarternary System*—which is made up of four formations: Alluvium, Bottom prairie, Bluff, Drift. These surface deposits are well developed and form the basis of our rich soils.

II. *Tertiary System.*—The beautiful variegated sands and clays and shales and iron ores which skirt the swamps of southeast Missouri along the bluffs from Commerce to the Chalk bluffs in Arkansas, belong to this system.

III. *Cretaceous (?) System.*—The ruptured and tilted beds of hornstone, variegated sandstones and clays, on the bluffs above Commerce, probably belong to this system.

IV. *Carboniferous System*—which is made up of the Coal measures, Kaskaskia limestone, Ferruginous sandstone, St. Louis limestone, Archimedes limestone, Encrinital limestone.

V. *Devonian System*—which contains the Chouteau limestone, Vermicular sandstone, Lithographic limestone, Hamilton shales, Onondago limestone (?), Oriskany sandstone.

VI. *Upper Silurian System*—of which we have Lower heldeberg, Niagara group, Cape Girardeau limestone.

VII. *Lower Silurian System*—of which we have the Hudson river group, Trenton limestone, Black river and Bird's-eye limestone.

Magnesian limestone series.
- 1st. Magnesian limestone.
- 1st or Saccharoid sandstone.
- 2d. Magnesian limestone.
- 2d. Sandstone.
- 3d. Magnesian limestone.
- 3d. Sandstone.
- 4th. Magnesian limestone.

The upper part of the Magnesian limestone series is doubtless equivalent to the Calciferous sandrock, and the lower part of the Potsdam sandstone.

VIII. *Azoic System.*—Below the Magnesian limestone series, we have a series of metamorphosed slates, which are doubtless older than the known fossiliferous strata, whether they belong to the Taconic, the Sanrentian or Huronian, I am unable to say.

IGNEOUS ROCKS.

These are porphyry, granite and greenstone, trapp. The economical relations of these rocks will be shown in treating of the useful minerals which they contain.

COAL.

Mineral coal has done much to promote the rapid progress of the present century; commerce and manufactures could not have reached their present unprecedented prosperity without its aid; and no people can expect success in those departments of human industry, unless their territory furnishes an abundance of this useful mineral.

Previous to the geological survey, it was known that coal existed in many counties of the state; but there was no definite knowledge of the continuation of workable beds over any considerable areas; but since the geological survey commenced, the southeastern outcrop of the coal measures has been traced from the mouth of the Des Moines, through Clark, Lewis, Shelby, Monroe, Audrain, Boone, Cooper, Pettis, Henry, St. Clair, Bates, Vernon and Barton, into the Indian territory; and every county on the northwest of the line is known to contain more or less coal, giving us an area of over 26,000 square miles of coal beds in that part of the state.

The geological survey has proved the existence of vast quantities of coal in Johnson, Pettis, Lafayette, Cass, Cooper, Chariton, Howard, Boone, Saline, Putnam, Adair, Macon, Carroll, Ray, Callaway, Audrain, and it is confidently expected that the counties to the northwest will prove to be as rich when fully examined.

Outside of the coal field, as given above, the regular coal rocks also exist in Ralls, Montgomery, Callaway, St. Charles and St. Louis; and local deposits of cannel and bituminous coal in Moniteau, Cole, Morgan, Crawford, Callaway, and probably other counties.

Workable beds of good coal exist in nearly all places where the coal measures are developed, as some of the best beds are near the base, and must crop out on the borders of the coal field. This is found to be the fact where examinations have been made. All of the little outliers along the borders contain more or less coal, though the strata are not more than forty or fifty feet thick.

But exclusive of these outliers and local deposits, we have an area of twenty-six thousand eight hundred and eighty-seven square miles of the regular coal measures. If the average thickness of workable coal be one foot only, it will give 26,887,000,000* for the whole area occupied by coal rocks. But in many places, the thickness of the workable beds is over fifteen feet; and the least estimate that can be made for the whole area is five feet. This will give 134,435,000,000 tons of good available coal in our state. In our efforts to estimate the economical value of so vast a deposit of this most useful mineral, we should constantly bear in mind the position of these beds, beneath the soil of one of the richest agricultural regions on the continent, within a state whose manufacturing and commercial facilities and resources are scarcely inferior to any, and adjacent to the Missouri river and the Pacific, the North Missouri and the Hannibal and St. Joseph railroads.

With all these advantages of location, the certainty that these coal beds can furnish 100,000,000 tons per annum for the next thirteen hundred years, and then have enough left for a few succeeding generations, is a fact of no small importance to the state.

The local deposits of cannel and common bituminous varieties furnish some of the best coal in the state, and though many of these will not yield sufficient quantities for exportation or extensive manufacturing purposes, they are of great value for supplying the local demand. But some of the beds of the cannel varieties could furnish a very large supply of an excellent article for gas oil and those manufacturing purposes where a light pure coal, producing an abundance of flame, is desirable.

IRON.

Among minerals iron stands pre-eminent in its influence upon the power and prosperity of a nation. Nations who possess it in large quantities, and by whom it is extensively manufactured, seem to partake of its hardy nature and sterling qualities. Missouri possesses an inexhaustible supply of the very best ores of this metal, and all desirable facilities for becoming the great iron mart of the western continent.

Specular oxide of iron.—This is one of the most abundant and valuable ores in the state. Iron mountain is the largest mass observed; it is two hundred feet high, and covers an area of five hundred acres, and is made up almost entirely of this ore in its purest form. The

*The mining engineers of England allow 1,000,000 tons per square mile, for every foot of workable coal.

quantity above the surface of the valley is estimated at 230,000,000 tons. But this is only a fraction of the ore here, as it descends to unknown depths, and every foot of the descent will yield some 3,000,000 tons.

Veins of this ore cut the porphyry at the shut-in, the location of the first iron furnace erected in this region. Fine beds of this ore were also found at the Buford ore bed, at the big Bogy mountain, at Russell mountain, at the James iron works, and other localities in Phelps county, and in sections two, three, ten and eleven, of township thirty-five, range four west, in Dent county, on the Southwest Pacific railroad; also, in section thirty-one, township thirty-seven, range twelve west, in Pulaski county.

Silicious specular oxide of iron exists in vast quantities in Pilot Knob, where it has been worked for many years.

The specular and magnetic oxides exist in large veins in the porphyry of Shepherd mountain. It is a very pure ore, and large quantities have been mixed and smelted.

There is enough of the very best quality within a few miles of Pilot Knob and Iron mountain to furnish one million tons of manufactured iron per annum for the next two hundred years.

All these ores are well adapted to the manufacture of pig metal, and the most of them are suitable for making blooms by the Catelan process and steel by the Bessemer process.

Hematite of good quality is very common, in large deposits, in the magnesian limestone series. It is also abundant, but generally of an inferior quality, in the ferruginous sandstone and tertiary rocks. Large quantities of this ore have been discovered in Cooper, St. Clair, Greene, Henry, Franklin, Benton, Dallas, Camden, Stone, Madison, Iron, Washington, Perry, St. Francois, Reynolds, Stoddard, Scott and Dent counties. The beds discovered in Scott and Stoddard counties are very extensive, and of good quality. The beds in the tertiary rocks of Scott county are of poor quality.

Bog ore is very abundant in the swamps of southeast Missouri. I examined vast beds of it in Scott county, on the stake glades. From this point the ore was seen at short intervals in St. John's lake down to the Iron Ore ford, where the quantity is very great. This ore also exists in Big Cypress, west of Sandy prairie. It was also discovered in extensive beds in the swamp southwest of Charleston, in Mississippi county. In Dunklin county, in Buffalo and Honey Cypresses, fine beds were discovered several miles in length. The quantity of this ore, in this part of the state, is very great; more than enough to supply all future demands.

SPATHIC ORE, OR CARBONATE OF IRON.

This ore is found in greater or less quantities in all parts of the state where the coal measures exist, but the most valuable beds yet examined are those in the tertiary rocks, in Scott county.

LEAD.

Next to iron, lead is perhaps the most abundant of all the valuable metals in the state. Our lead mines have been worked with great success for the last half century. It is true, that the amount of mining done and the success of various points has been somewhat variable, as is always the case in mining operations where conducted and carried on by men who have but little capital and practical knowledge of the work, as ours have been, in some considerable degree, at least. Many of our mines have been neglected for various reasons—some on account of disputed titles; others from the general depression of the business, and others on account of the late military troubles. But there is no good reason to suppose our mines would be less productive now than at any previous period. Few or none have been exhausted, and many are now worked with greater success than at any previous time. All the facts encourage a more extended effort to work and more fully develop some of the neglected mines and open new ones.

Our space will not permit a detailed account of the lead mines of the state. There are more than five hundred localities, old and new, that promise good returns to the miner. Two hundred and sixteen have been catalogued in my report on the Southwest Branch of the Pacific railroad.

The eastern lead region comprises a large portion of Franklin, Washington, Jefferson, Crawford, Phelps, Dent, Madison, St. Francois, Ste. Genevieve, and some parts of the adjoining counties, giving an area of some five thousand square miles.

The southwestern lead region comprises a large portion of Newton, Jasper, and small tracts of the adjoining counties, making an area of about two hundred square miles.

The Osage lead region contains a considerable portion of Cole, Moniteau, Morgan, Benton, Camden and Miller counties; an area of about one thousand square miles.

The southern lead region comprises portions of Taney, Christian, Webster, and perhaps other counties. The extent is not known, as that part of the state has not been fully examined, but there is at least 100 square miles in the counties above named.

It is not to be supposed that these areas, large as they are, contain all the lead lands of the state.

We have not yet examined a single county south of the Osage and the Missouri, save in the swamp country, without finding in it more or less of this valuable mineral, and besides, nearly all the counties are underlaid by the true lead-bearing rocks of our state. We have then 6,300 square miles in which lead deposits, in workable quantities, have been found and successfully worked; and at least 15,000 square miles more of lead-bearing rocks, where we may reasonably expect to find valuable deposits of this mineral. I must refer to the geological reports for the detailed account of our lead mines.

COPPER.

The copper mines of Shannon, Madison, and Franklin counties have been known for a long time. Some of the mines of Shannon and Franklin were once worked with bright prospects of success; some in Madison are still worked with good results.

Deposits of copper have been discovered in Dent, Crawford, Benton, Maries, Greene, Lawrence, Dade, Taney, Dallas, Phelps, and Wright counties.

But the mines in Franklin, Shannon, Madison, Crawford, Dent, and Washington give greater premise of yielding profitable results than any others yet discovered.

When capitalists are prepared to work these mines in a systematic manner they may expect good returns for the money invested.

ZINC.

Sulphuret of zinc is very abundant in nearly all the mines in southwestern Missouri, particularly in those mines in Newton and Jasper, in the mountain limestone.

The carbonate and the silicate occur in the same localities, though in much smaller quantities. The ores of zinc are also found in greater or less abundance in all the counties on the southwestern branch; but the distance from market and the difficulties in smelting the most abundant of these ores, the sulphuret, have prevented the miners from appreciating its real value.

It often occurs in such large masses as to impede very materially the progress of mining operations. For this reason blackjack is no favorite with the miners of the southwest.

Many thousand tons nave been cast aside with the rubbish as so much worthless matter; but the completion of the Southwestern Branch will so lessen the cost of transportation as to give a market value to this ore, and convert into valuable merchandise the vast quantities of it, which would be so easily obtained in Jasper, Newton and other counties of the southwest.

Considerable quantities of the sulphuret, carbonate and silicate also occur in the eastern lead regions. At Perry's mine, at Mt. Hope mine, in township 36, range 33, sections 4 and 7, and at a locality near Potosi, these ores exist in some considerable quantities; but little has been done to test the value of the ores of zinc in these and other localities in the state.

Probably the largest deposit of calamine thus far found in the state is in Taney county.

COBALT AND NICKEL.

Ores of these metals are obtained in some considerable quantities in mine LaMotte, and small quantities have been discovered in other localities.

MANGANESE.

The peroxide of manganese exists in small quantities in the second sandstone on the plankroad west of Ste. Genevieve, and at Buford's ore bank.

SILVER.

Silver has not been discovered in the state, save in small quantities in the sulphuret of lead.

GOLD.

Gold has been found in very small qualities in a few places in the State, but it is doubtful whether any of the localities will pay for working them.

BUILDING MATERIAL.

The possession of materials for the construction of habitations is one of the first necessities of the human race, and as the race advances in civilization and wealth, the demand for the more beautiful and durable qualities constantly increases, and it becomes a matter of no small importance to determine whether we are prepared to supply the demand which our advancement will create for dwellings, warehouses and public edifices.

Our examinations in Missouri prove the existence of such materials in nearly every formation in the state.

Limestones, suitable for building purposes, are abundant in the upper and middle coal series, in the St. Louis limestone, the Archimedes limestone, the Encrinital limestone, the Chouteau limestone, the Onondaga limestone, the Cape Girardeau limestone, the Trenton limestone, and the second, third and fourth Magnesian limestones.

All these formations are more or less employed in the places where they are exposed. Numbers one and six of the upper coal series furnish the rock used in the Presbyterian church and the public house erected by Mr. Park, at Parkville, and in the public buildings at Fort Leavenworth, all of which indicate their durability and beauty, and the ease with which it is wrought into any desirable form renders it a very economical building material. Number forty-one of middle coal series, is a light gray semi-crystalline limestone, which is both durable and beautiful. It is used at Lexington.

The St. Louis limestone has many beds of excellent rock, which are extensively quarried and employed for various purposes in St. Louis county. The Archimedes beds furnish a great amount of very durable limestone. It is used for the custom-house in St. Louis. The Encrinital strata are more extensively employed for economical purposes than any other limestone in the state.

The state university, and the court-house at Columbia, furnish abundant proof of its adaptation to building purposes. The upper

beds of Trenton limestone, and the dark compact and the light magnesian strata in the lower part, are very desirable building stones, but the middle beds are not so durable; still they are sometimes used. The court-house in St. Louis presents good examples of the Trenton limestone.

The strata of cotton rock so abundant in the Magnesian limestones, are much used. The state house, court-house, and many other buildings at Jefferson City, show the adaptation of this limestone to such purposes. This is the same as the bluff limestone imported into St. Louis from Illinois for houses. This rock is equally good at many localities in our own state. These formations, also, contain numerous beds of the silicious and the magnesian crystalline varieties, which are much stronger and more durable than the cotton rock.

MARBLES.

There are several beds of excellent marble in the state.

The fourth division of Encrinital limestone is a white, coarse-grained crystalline marble, of great durability. It crops out in several places in Marion county. One of the best localities is in the bluffs of the Mississippi, between McFarlin's branch and the Fabius. The Lithograph limestone would furnish a hard, fine-grained, bluish drab marble that would contrast finely with white varieties in tesselated pavements for halls and courts.

The Cooper marble of the Onondaga limestone has numerous pellucid crystals of calcareous spar disseminated through a drab or bluish drab, fine, compact base. It exists in great quantities on the LaMine, in Cooper, and on See's creek, and in other places in Marion; and it is admirably adapted to many ornamental uses.

McPherson's marble, a bed of the Trenton limestone, situated in the vicinity of Rattlesnake creek, is a hard, light colored, compact limestone, intersected with variegated surface. When well polished, it appears to be strong and durable. McPherson's marble block, on Fourth street, St. Louis, in constructed of it.

Cape Girardeau marble is, also, a part of the Trenton limestone, located near Cape Girardeau. It is nearly white, strong and durable. There are several beds of very excellent marble in the magnesian limestone series. In sections thirty-four and thirty-five of township thirty-four, range three east, are several beds of semi-crystalline light-colored marbles, beautifully clouded with buff and flesh colors. They receive a fine polish, are durable, and well fitted for many varieties of ornamental work and building purposes. But one of the most desirable of the Missouri marbles is in the third magnesian limestone, on the Niangua. It is a fine-grained, crystalline, selico magnesian limestone, of a light drab, slightly tinged with peach-blossom and beautifully clouded with the same hue or flesh color. It is twenty feet thick, and crops out in the bluffs of the Niangua. This marble is rarely surpassed in the qualities which fit it for ornamental architecture.

There are, also, several other beds in this and the other magnesian limestones, which are excellent marbles. Some are plain, while others are so clouded as to present the appearance of breccias.

The beautiful Ozark marbles are well known. Some of them have been used in ornamenting the capitol at Washington.

GRANITE.

Granite Knob will furnish any amount of a superior coarse granite, admirably well adapted to all structures where durability and strength are desirable. Its introduction to general use in St. Louis would add much to the architectural effects produced by her public and private edifices.

BRICK.

The pipe-clay and sands of the drift will furnish a large amount of the very best materials suitable for manufacturing the most durable and beautiful bricks. The argillaceous portions of the bluff make a very good article. It is generally diffused, and is almost universally employed for that purpose. Nearly every township in the state has an abundance of these clays.

FIRE-BRICKS

Are manufactured from the fire-clays of the lower coal series in St. Louis county. These bricks have the reputation of possessing fine refractory properties. There are many beds of fire-clay in the coal measures; and, besides, some beds of the Hudson river group, in Ralls and Pike counties, of the Hamilton group, in Pike and Marion, and of the vermicular sandstone and shales on North river, seem to possess all the qualities of the very best fire-clays. The quantity of these clays is great, almost beyond computation. No possible demand could exhaust them.

FIRE-ROCK

Has often been observed, and a few localities were mentioned in Chapter I. Some of the more silicious beds of the coal measures are very refractory, as many have discovered. The upper strata of the ferruginous sandstones, some arenaceous beds of the encrinital limestone, the upper part of the Chouteau limestone, and the fine grained impure beds of the magnesian limestones, all possess qualities which will enable them to withstand the action of fire. But the second and third sandstones are the most refractory rocks yet examined. They are used in the furnaces at Iron mountain and Pilot Knob.

PAINTS.

There are several beds of purple shales in the coal measures, which

seem to possess the properties requisite for paints used in outside work. Numbers ten, thirty-one and fifty of this formation* have shades of a bright purple color and firm texture. But number ten possesses the best qualities. Yellow and red ochres are found in considerable quantities.

CEMENTS.

All of the limestone formations in the state, from the coal measures to the fourth magnesian, have more or less strata of very nearly pure carbonate of lime, which will, consequently, make good quicklime. But few, if any, of the states have such an abundance and so general a distribution of this important article of domestic use.

HYDRAULIC CEMENT.

All the limestones, whose physical characters indicated hydraulic properties, have been collected, and some of them subjected to analysis. So far as can be judged from the results obtained we have many beds possessing hydraulic properties.

The middle beds of the vermicular sandstone and shales are hydraulic, as indicated by the analysis.

The upper beds of the lithographic limestones come in this class.

The analysis and description show good hydraulic properties in the Cape Girardeau limestone.

Several beds in the magnesian limestone formations are hydraulic.

The upper division of the Chouteau limestone formation, as it is developed in Boone, Cooper and Moniteau counties, gives the best indications of excellent hydraulic properties, both in its texture and composition. These very much resemble the hydraulic strata at Louisville, and they would furnish any desirable quantity.

The upper and lower beds of the Hudson river group give good evidence of being hydraulic.

From present indications the hydraulic limestones of our state may be expected to supply the home demand and furnish large quantities for exportation.

ROAD MATERIALS.

In a country where the superficial deposits make such bad roads it is a matter of no small importance to have an abundance of good materials for highways. The limestones, so abundant in the country, are much used for macadamized roads. But the rapid pulverization of lime rock, and the consequent mud and dust, particularly in towns and cities, render it very desirable to point out a more durable and economical substitute. The coarse gravels of the boulder formations, and of the river-beds, furnish an abundance of the best possible sub-

*See Second Annual Reports.

stitute. These deposits contain gravels of any degree of fineness, from the sand, suited to formation of footpaths, to the pebbles best adapted for carriage ways. Any amount of any given coarseness may be obtained by screening, in all parts of the country, either from the drift or the river-beds.

These pebbles have the advantange of limestone in several particulars: First, they are more durable, being fragments of cherl and the harder igneous and chrystalline rocks, which have withstood the action of those unknown but all-powerful causes which have worn away and ground to dust so large a portion of our superficial rocks, and transported to our territory such quantities of the rocks in situ, several hundred miles to the north. Those from the river beds, also, have been exposed to aqueous action for unknown ages; second, they are less injurious to animals and carriages, as all the pebbles are water-worn and rounded; third, by their use we should avoid the impalpable dust of the limestone, so injurious to health and property in our cities. We should, also, escape much of the mud, which is scarcely less objectionable.

SOILS.

The soil of a country is the great source of national prosperity and power, and individual wealth and happiness. Adam commenced his cultivation in Eden, and his successors on the earth have ever found its culture their most useful and delightful employment.

No department of agricultural science is more defective than the classification and nomenclature of soils. No system has been adopted by which the many varieties of soils can be so arranged and described that all can be readily identified. This state of the case is due doubtless to two principal causes: First, the varieties of soils pass into each other by such an infinite number of graduations that it is well-nigh impossible to point out any definite lines of separation; second, farmers have been so averse to scientific names which are definite, that writers on the subject have used the indefinite terms generally employed—often too, in a sense entirely different from their common signification among farmers, thus creating a confusion of names.

I shall, therefore, describe the principal varieties of soils under the names most commonly applied to them, as I have learned them from the farmers in the various parts of the state. Some will be disappointed in not finding their favorite names, as the same soil is known by different names in diffent regions of the country, and as the varieties are so numerous, that it will be impossible to enumerate all in the limits assigned to this article. The most important and marked varieties only will be described.

In the popular nomenclature we have some very general names, which are very definite when considered in some one of their relations, and very indefinite in respect to other and equally important relations, as timbered lands and prairie lands. These names distinctly

mark the soils in the timber and those on the prairie, but do not indicate the quality of the soils any further than they are produced by those relations. To the same class of names belong bottom lands and uplands, sometimes called bluff lands. These terms, like those named above, point out an important natural division of our soils, though they have no reference to the fertility of those in either division.

Prairie lands are well defined by nature, and distinct from timbered lands in respect to the vegetation they naturally produce. The latter produce trees and shrubs and some grasses, and other herbaceous plants; and the former produce grasses and other herbaceous plants only. But each division contains soils of all grades of productiveness, from the very best to the poorest. And yet the timbered lands have one marked advantage over the prairie. If two soils be taken side by side, both based upon the same formation, and both subject to the same influences during their formation, save one has produced trees and the other grasses, and the trees have decayed on the one and the grasses have been burned on the other, the former will have more decaying vegetable matter, and will be lighter, warmer and more kindly in cultivation. But if both be put under the same culture, this difference will gradually disappear, as the vegetable matter will decrease in one and increase in the other. This difference in these classes of soils rendered the timbered lands much more popular among the old settlers.

These prairie lands occupy nearly one-half of the entire area of the state (as previously shown), or about 30,000 square miles. They possess all the varieties of soils found in the timber, and all identical with them, save in the difference above named.

The grasses are as diversified and as distinctly mark the varieties of soil on the prairies as do the trees in the timber. The resinweed, crow-foot and wild sorghum indicate as good soils on the prairies as do the elm, hickory and walnut in the timber. But as the trees are more conspicuous and better known, the varieties of soils are best known by the timber they produce.

Bottom lands is a term commonly used to designate the lands lying in the broad level valleys of our streams. They are divided into bottom timber and bottom prairie.

The bottom prairie is usually a light, rich and very productive soil, and the surface is usually very level and sustains a heavy growth of grasses.

This soil is but little affected by wet or dry seasons. It seldom fails of yielding the very best crops of hemp, corn, tobacco, wheat and other staples.

Very good samples of this soil may be seen on Bowling Green and Wyaconda prairies, on the Missouri.

There are a few areas of considerable extent occupied by the bottom prairie on the Mississippi, as in St. Charles and Marion counties. There are but few below St. Louis. There is but little of it on the

Missouri below Glasgow, but above that city nearly one-half of the broad bottoms are prairie; some of them twenty to thirty miles long, and six to twenty miles wide, as the glorious Wyanconda and the Huppan Cuty.

This variety of soil covers at least 1,000,000 square miles in the bottoms of our two great rivers.

It is not surpassed by any in the country in ease of cultivation, and never-failing abundant crops of the great staples of the country.

The bottom prairies are constantly decreasing by the action of the rivers, the encroachments of the timber and by cultivation

Alluvial bottom and bottom timber are terms given to the timbered portions of our river bottoms. There are several varieties of bottom lands, which are usually designated by the terms high bottom, low bottom, wet bottom, swamp and cypress.

High bottoms have light, deep, porous, silicious soils, which produce a magnificent growth of white, red and whahoo elms, sugar maple, ash, cherry, locust, linden, coffee-tree, black and swamp gum, buckeye, crabapple, bur, red, black, laurel, scarlet, Spanish, swamp, white and rock-chesnut oaks, dog wood, thick shellbark and pignut hickories, hackberry, persimmon, red bud, black and white walnuts, plum, pecan, holly, mulberry, pawpaw, prairie rose, strawberry bush, river, frost and muscadine grapes, trumpet and Virginia creepers, poison ivy, wistaria and staff-tree.

It covers all the high bottoms of our rivers, an area of at least 5,000,000 square acres. It is one of our best and most productive soils. It is so light and porous that it is very little affected by wet or dry season, and the crops seldom fail upon them. These lands are above the ordinary high waters.

Low bottoms have soils similar to the high bottom, but so low that they are covered by the ordinary overflows. Sycamore, cottonwood, white maple, box elder, red birch, buckeye, hackberry, willow, river and frost grapes and poison ivy, are the most common productions. They grow to vast proportions.

The overflows render these lands nearly useless for farming purposes; but when the floods are kept out by levees, they are most productive and valuable. There are large areas of these lands in southeast Missouri.

Swamp, or wet bottom, are terms usually applied to a variety of bottom lands very similar to the two preceding; but differ in being so located as to be saturated with or nearly covered by water. This excess of water renders them useless for ordinary cultivation. It sustains a heavy growth of pin, bur, swamp, white, laurel, black and red oaks, plum, holly, spice bush, white and black ash, red birch, box elder, button bush, sycamore, cottonwood, coffee-tree, dogwood, red and whahoo elms, sweet gum, thick shellbark hickory, Judas tree, hornbeam, water locust, white and red maple, pawpaw, staff-tree, crossvine, poison oak, frost and river grape.

Cypress.—This name is given to low bottoms which are covered with standing water for a large part of the year. The decomposition of vegetable matter in these waters adds a new deposit of vegetable mold annually to their rich soil, which sustains a very heavy growth of cypress, tupelo, sour gum, ilex, white ash, box elder, sycamore, button bush, red and whahoo elms, hackberry, water locust, white and red maple, sweet gum, sassafras, willows, laurel, pin and Spanish oaks, pawpaw, cottonwood, black thorn, trumpet creeper, rattan vine and poison oak.

These cypresses are numerous and very extensive in southeast Missouri. Buffalo cypress and honey cypress are good samples. The central and wettest portions of them usually have deposits of bog ore. These soils are useless for ordinary farming purposes.

The uplands have a greater variety of soils, some of which have received names derived from the trees they produce; as hackberry lands, hickory lands, white oak lands, post oak lands, blackjack lands, and pine lands.

Hackberry lands possess the best upland soil in the state. The growth is hackberry, American elm, wild cherry, redbud, pawpaw, honey locust, pignut hickory, coffee-tree, swamp, white and chesnut oaks, black and white walnut, mulberry, linden, river and summer grapes.

This soil is prevalent in Jackson, Buchanan, Lafayette, Cass, Saline, Clay, Platte, Ray, Chariton and other counties.

Where the subsoil is more argillaceous this soil is somewhat inferior; as in parts of Marion, Howard, Pike, Boone, Carroll, Andrew, Bates, St. Louis, and many of the western and northern counties.

This soil is also called hemp land, and when on the prairie it is known as resinweed land and crowfoot land. It yields superior crops of hemp, tobacco, corn, wheat and the other staples of the country. Fruits of all kinds do well upon it.

Hickory land has a soil inferior to the last. Common and shellbark hickory, white, black, scarlet, chesnut and laurel oaks, sugar maple, blue ash, black gum, mulberry, honey locust, black walnut, pawpaw, redbud, persimmon, dogwood, red and black haws, linden, summer and frost grapes, grow upon it. This soil covers a large area in central and southern Missouri, yields good crops of the staples of the country, and is well adapted to fruit culture.

There is a soil based upon the red clays of southern Missouri nearly similar to this in fertility and productions.

White oak lands occupy ridges and hills where the soils are inferior to the last variety. The growth is white, black and scarlet oak, shellbark hickory, dogwood, sassafras, redbud, sumach, blueberry and summer grape.

Nearly all the poor lands north of the Missouri belong to this variety of soil. On the south side of the river the same quality of soil, or one rather inferior, is called postoak lands. It occupies the

same positions and sustains the same growth, with postoak for the principal tree, and sometimes other trees and vines. It covers large areas in southern Missouri.

Magnesian limestone soils are dark, warm, light and very productive; but they are often so situated on hillsides and in narrow valleys as to be inconvenient for ordinary tillage. They produce black and white walnuts, black gum, white, red and whahoo elms, sugar maple, honey locust, mulberry, white, rock-chesnut, chesnut, post, laurel, black, scarlet and Spanish oaks, persimmon, redbud, sassafras, blue ash, common, shellbark and bitternut hickory, buckeye, hazel sumach, dogwood, summer, river and frost grape.

This variety of soil covers the hillsides, slopes and narrow valleys of all the country underlaid by the magnesian limestone series, extending from Callaway south to the Arkansas, and from Jefferson west to Polk county, an area of some twenty thousand square miles.

This area includes the Osage, the southern and southeastern mineral regions and all the country connecting them.

The white oak and postoak lands cover large areas, and, under good cultivation, yield good crops of corn, wheat, rye, oats, tobacco and hay. The subsoil is usually richer than the surface, and deep plowing makes a vast difference in their productive powers. These lands are very superior for fruit culture, and cover many millions of square miles in southern Missouri, and smaller areas in the northern.

Blackjack lands are the poorest of all. They occupy poor, rocky or sandy ridges and hills, and sustain a stunted growth of blackjacks, black hickory and summer grapes. These lands have but little value for ordinary culture, but may be made profitable in fruit culture. Blackjack ridges occupy considerable areas south of the Missouri and very limited ones on the north.

Pine lands have a sandy soil, and occupy the plateaus, ridges and hills underlaid by the sandstones of the magnesian limestone series. The timber is pine, post, white and black oaks, black hickory, dogwood, sassafras and summer grape.

This is one of the most fertile soils in the state, and produces excellent crops of all the staples of the country, but it is peculiarly adapted to the culture of the grape and other fruits. The fruit trees and vines upon this soil are thrifty and productive. The broken nature of the country and the flints, often mingled with this soil, render it more difficult of cultivation; but its superior fertility and peculiar fitness to the grape and other fruit will induce cultivators to overcome these objections, when its great value is better known. The time is not far distant when these hillsides and ridges of this sunny and temperate and beautiful region will be covered with vineyards, and the songs of the vine dresser and the merry vintage will make its teeming thousands prosperous, temperate, healthful and happy.

These lands, together with the postoak and pine lands, which cover the ridges, plateaus and hillsides of the mining regions, will

enable those favored sections to sustain a large agricultural population, in addition to the large mining population which will be drawn to it by the inexhaustible mineral deposit.

NATIVE PASTURES.

Nearly one-half of state is occupied by broad, rich prairies, which produce abundant crops of native grasses which rival the cultivated species in luxuriance and nourishing properties. The young prairie grasses are scarcely inferior to the famous blue grass for pastures, and when cut before the seed is ripe, it is equal to timothy and clover for hay. This is proved by the fact that in the prairie regions of our state, and westward, good prairie hay brings as good prices as that from the cultivated grasses. These grasses are not confined to the open prairie, but grow luxuriantly on the ridges and hillsides of the upland forests in all southern Missouri.

Canebrakes are abundant in the rich bottoms of the southern counties, especially those of the southeast. The cane is evergreen, and furnishes most excellent pastures during the entire year. In the winter its dense foliage affords the very best shelter, as well as food for the stock of these favored grazing regions.

Pea vines are also very abundant in the timbered bottoms of the state, and furnish very attractive and nourishing winter pastures.

The fruit of the numerous species of oak, hickory, walnut, pecan, beech and hazle, usually furnish a large supply of food, most grateful to swine, turkeys and other mast-eating animals.

These facts, together with the abundance of pure water, render Missouri, particularly the southern part, a most favored grazing region. The temperate summers and the short, dry and mild winters, enable horses, mules, neat cattle, sheep, goats and swine to live and thrive upon our native pastures with little or no extra food, and small care from the herdsman.

TREES SHRUBS AND VINES OF MISSOURI.

(From the unpublished notes of the geological survey.)

ALDER.

Alnus serulata (common alder).—On streams. The charcoal of this alder is much used for the manufacture of gunpowder.

Prinos (*Ilex*) *laevigatus* (black alder).—Winter berry. In damp woods. Its red berries render this, and perhaps two other species, conspicuous in our winter forests.

APPLE.

Malus cororaria (crab apple).—On borders of prairies and fields, and in open forests. Ornamental. The most beautiful shrub of our prairie borders and forest glades.

ASH.

Fraxinus Americana (white ash). Excellent timber for carriages and wagons.

Fraxinus quadrangulata (blue ash).—Rich soil.

Fraxinus sambucifolia (black ash).—Rare. This timber is used for baskets and chair bottoms.

Zanthoxylum Americanum (prickly ash).—In rich, moist soils. Medicinal.

AZALEA.

Azalea nudiflora (?) (mountain honeysuckle).—A beautiful shrub in the mountains of Madison county.

ASPEN. (See cottonwood)

BASSWOOD.

Tilia Americana (American linden or lime).—In rich soils, on upland and in bottoms.

Tilia heterophylla (?) (large leaved lime, or linden).—In rich soils. Linden is used for carriages and cabinet work. It is also used for inside work in building.

BEECH.

Fagus ferruginea (American beech).—The wood is hard and strong, and suitable for plane stocks and other implements. In good soil in southeast Missouri.*

BIRCH.

Betula rubra (red birch, river birch). On the overflowed banks of streams, with willows, cottonwood and sycamores. Its timber is beautiful, and suitable for various kinds of cabinet work. It makes an excellent charcoal.

BLACKBERRY.

Rubus villosus (high blackberry).—Borders of thickets and fence rows. Its fruit is excellent and abundant.

Rubus cuneifolius (?) (wedge leaved or sand blackberry).—Fruit very good.

Rubus trivialis (low bush blackberry or dewberry).-Large, delicious fruit. The wild species of blackberry are common and yield an abundance of excellent fruit. The Lawton and Dorchester are cultivated with great success in the state.

BLADDER NUT.

Staphylea trifolia (bladder nut).—Common on banks and rocky slopes. The showy, pendent racemes of white flowers and bladder-like seed vessels render this shrub ornamental and unique.

*Where no locality is given the tree is generally diffused where the soil is suitable.

BURNING BUSH.

Euonymus atropurpureus (whahoo, arrow wood, burning bush).—This is a common and beautiful shrub. In autumn the crimson seeds hang like pendent jewels from the scarlet calyx, and the leaves change to a deep bright crimson. It renders the autumnal thickets rich and gay.

Euonymus Americana (strawberry bush).—Common in the swamp region of southeast Missouri, where it grows in the forests. The scarlet seeds, suspended below the crimson pod, ornamented with dark papillæ, render this shrub more beautiful than the preceding. Its name comes from the beautiful seed vessel, which so much resembles some varieties of the strawberry. Many of our nurserymen sell the burning bush for the strawberry bush.

BUTTON BUSH.

Cephalanthus occidentalis (button bush).—Common in wet places. Its numerous globular heads of white flowers render it ornamental.

BUTTON WOOD.

Platanus occidentalis (sycamore, American plane tree, button wood.)—This is the largest of all our forest trees. It is abundant on the overflowed margins of our streams. The wood resembles the maple in general appearances, and has been used for some varieties of common furniture. It warps in seasoning more than any common lumber.

BUCKEYE.

Æsculus flava (large buckeye).—This tree is common in our river bottoms, and it often grows in rich, moist uplands. It is conspicuous in spring for its early rich foliage, and numerous large, showy thyrses of yellow flowers. But few trees are more magnificently beautiful than the large buckeye, covered with its rich green foliage and large, upright panicles of bright flowers. It is scarcely inferior to its oriental cousin, the horse chesnut, from the Levant.

Æsculus glabra (?) (Ohio buckeye).—A small tree and not so showy as the last.

BLUEBERRY.

Vaccinium.—Several species (?), common on mountains and dry, rocky hills. The fruit is not so large nor abundant as in the northern states.

BOX ELDER.

Negundo aceroides (box elder or ash-leaved maple).—It grows in the bottoms and sometimes on rich uplands. The wood is fine grained,

saffron colored, and shaded with violet. In Europe it is used in cabinet work, particularly for inlaying. The wood is beautiful and might be made useful for such purposes in this state.

BUCKTHORN.

Rhamnus lanceolatus (American buckthorn).—Hillsides and river banks.

BUMELIA.

Bumelia lanuginosa (bumelia).—It grows near St. Louis; one species is very common on the glades over the magnesian limestones in the southern part of the state. Its spines and branching habit might make it a good hedge plant.

Bumelia oblongifolia (oblong-leaved bumelia).—Common in rocky glades in southern Missouri.

Bumelia lycioides (smooth-leaved bumelia or southern iron wood). In low, rich soils in southern Missouri.

CATALPA.

Catalpa bignonioides (catalpa or Indian bean).—This magnificent tree is common in the bottom lands of southeast Missouri. The trees on the open banks of the Mississippi are small, crooked, straggling, and picturesque, but in the forests they are large, upright and often three and four feet in diameter and seventy or eighty feet high. The timber is very durable. Many of the trees in the New Madrid country, which were killed by the earthquake of 1811, are still standing and quite sound. These dead trees are much used for canoes and other purposes where light, durable timber is desirable. The broad leaves and large conical thyrses of white and purple flowers render this one of the most beautiful and magnificent trees of the American forest. In its peculiar style of grand beauty it is scarcely inferior to the magnificent pawlonia. It grows rapidly and is easily propagated by seed.

CHERRY.

Cerasus serotina (wild cherry, black cherry).—This tree is common on rich soils. It is a beautiful tree when covered with its numerous racemes of white flowers. The wood is fine, hard and reddish, or nearly the color of mahogany. It takes a fine polish and is much used in cabinet work and for gunstocks.

Cerasus Virginiana (choke cherry).—This shrub is very rare in the northern part of the state only.

CEDAR.

Juniperus Virginiana (red cedar or savin).—Common on the rocky bluffs of our streams, where it often grows to the hight of forty

or fifty feet. The wood is fine grained, light, highly colored, much used for fence and telegraph posts, pails and tubs, and all purposes where light and durable timber is needed.

Large quantities of it are now being cut and shipped from this state to Europe for the manufacture of pencils. This tree is much cultivated as an ornamental evergreen. Its fruit is medicinal. The twigs often have brown excresences, which send forth long gellatinous orange-colored threads in wet weather. They are the seed vessels of a minute fungus—podisoma macropus.

CANE.

Arundinaria macrosperma (cane).—This singular plant is very abundant in southeast Missouri, where it forms dense canebrakes. When small it makes most excellent winter pastures. Animals thrive better in these cane pastures in the winter than in the summer, as there are no insects to trouble them.

The ancient mound builders used the canes (split) as we do laths in plastering rooms in their houses or mounds. Large quantities of them are now used for fishing-rods and pipe-stems.

CHESNUT.

Castanea vesca (chesnut).—I have observed this tree in but one place in the state, on Bird's island, a high, round rocky hill in the "swamp" of southeast Missouri.

COFFEE TREE.

Gymnocladus canadensis (coffee tree). Common in rich, moist soils, both bottom and upland. Its wood is hard, tough, compact and rose-colored—beautiful for cabinet-work.

CORAL BERRY.

Symphoricarpus vulgaris (Indian currant, coral berry).—This small, beautiful shrub is very common, and often troublesome to the husbandman. It has numerous clusters of purple berries, which usually remain on the most of the winter. The fruit is not so large as that of its white sister, the snowberry.

COTTONWOOD.

Populus angulata (angled cottonwood, or Carolina poplar).—A large tree, similar to and associated with the following:

Populus monilifera (canadensis of Mx., cottonwood).—This is one of our largest forest trees, and grows abundant on our rich overflowed bottoms. Its timber is valuable for rails and carpentry.

Populus heterophylla (argentia Mx., cotton tree, or downy-leaved poplar).—In the bottoms of southeast Missouri.

Populus grandidentata (?) (large-toothed aspen).—On high land in Howard county. I saw several trees in Howard similar to, if not identical with, this aspen.

Populus tremuloides (American aspen).—In Franklin county.

Populus alba (white poplar, silver-leafed poplar, abele).—This beautiful foreign tree has in some places escaped from the hands of the cultivator and become naturalized.

CROSSVINE.

Bignonia capriolata (cross-vine).—This beautiful vine grows in the swamps of southeast Missouri, where it climbs the highest trees.

CURRANT.

Ribes ——. One or two species have been observed in the state; very rare.

CYPRESS.

Taxodium distichum (American cypress).—Common in the swamp country of southeast Missouri. The wood is soft, light and durable. It is much used for carpentry and parts of cabinet-work, and especially for shingles and weather-boards. It is one of the largest and finest trees of the forest.

DOGWOOD.

Cornus Florida (flowering dogwood).—This beautiful species is very common, and its large flowers are very conspicuous in the spring

Cornus sericea (silky cornel, kinni-kinnik).—Common on the borders of streams.

Cornus asperifolia (rough-leafed dogwood).—In dry, rather poor soils.

Cornus paniculata (panicled cornel).—In thickets in moist rich soils, usually water.

ELDER.

Sambucus canadensis (common elder).—In low, rich ground. This is a beautiful shrub when its broad, flat, white cymes are in bloom, or when its purple fruit are ripe. The berries are used for wine, and its flowers for a domestic medicine.

ELM.

Ulmus Americana (white elm, American elm).—Abundant in deep, rich soils. This is the most desirable of all our shade trees. It grows large and gracefully magnificent. The wood is tough and used for hubs of light carriages.

Ulmus fulva (red elm, slippery elm).—Very abundant in moist, rich soils. The wood is more highly colored, and superior to that of the white elm. Its inner bark yields a most valuable and popular medicine.

Ulmus alata (winged elm or whahoo).—This curious tree is common in the southern part of the state. I have never seen it north of the Missouri river.

Ulmus racemosa (Thomas' elm).—A few small trees only were observed in this state.

FALSE INDIGO.

Amorpha fruticosa (false indigo, prairie locust).—This beautiful shrub is common in the rocky beds of branches, especially in the prairies. Its pinnate leaves, similar to those of the locust, and its abundance in the prairies, has given it the common local name, "prairie locust." Its long spikes of purple flowers and beautiful foliage render this little shrub highly ornamental to the rough places it is made to adorn.

Amorpha canescens (lead plant).—Common on dry, rocky hills in the southern part of the state. Not so abundant north. This small shrub has been considered a good sign of lead, but no intelligent miner relies upon it.

GRAPE.

Vitis æstivalis (summer grape).—Common on dry, rocky slopes and ridges. This is usually a small vine; but, in rich soils, it becomes very large, and climbs to the tops of the highest forest trees. It produces the largest wild grapes in the state. The berry is mild and pleasant, and is often used for wine.

Vitis riparia (river grape).—The vine is abundant in the rich alluvial bottoms on the borders of our streams, where it grows very large, and climbs to the tops of the highest trees and mingles its clusters with their foliage. There are many varieties between this and the *æstivalis*. Some vines have the thick leaves of the summer grape and the small sour fruit of the *riparia*. The clusters of the summer grape are often short and cylindrical, without shoulders.

Vitis cordifolia (winter grape, frost grape).—This grape is also common on rich, moist soils, and often grows very large. There are many varieties between this and the river grape.

Vitis vulpina (muscadine, southern fox grape).—I observed this vine only in the high portions of the swamp country of the southeast Missouri. My attention was first called to it by Dr. Horner, of Dunklin county, where we measured a vine nine inches in circumference and thirteen feet high.

Vitis rupestris (Texas grape, rock grape).—I observed this peculiar vine in several places in the rocky beds of "dry branches" in Franklin county. Its fruit is nearly as large as the summer grape, in small clusters. It ripens before the summer grape in August. It does not climb like other grapes, but runs along the dry beds of the watercourses, sending down roots from the joints of the canes as it progresses. Its foliage resembles that of the Clinton grape. It should be cultivated.

Vitis ——. There is a grape rarely found in this state (very abundant in Kansas) which is distinct from any of the preceding. It resembles the river grape in the foliage and size and habits of the vine; but the berry is larger, in small compact shouldered clusters. It ripens in July. The berry is acid and filled with a purple pulp. Highly colored juice.

Vitis indivisa.—I saw this vine at the Chouteau springs, in Cooper county, and in Holt county.

Vitis bipinnata.—On the river banks in Cape Girardeau and Pemiscot counties.

GREEN BRIER.

Smilax rotundifolia (green brier in thickets).—A great nuisance.

Smilax glauca.—Glaucus green brier.

Smilax tamnoides.—The green briers are so interwoven in the thickets along our streams that it is difficult to pass through them without coming in disagreeable contact with their spines.

Smilax hastata.—In southeast Missouri.

GOOSEBERRY.

Ribes cynosbati (prickly gooseberry).—In moist rich land.

Ribes rotundifolium (wild gooseberry).—The shrub is frequently transplanted to gardens for its fruit, which is much used for tarts.

GUM.

Nyssa sylvatica (black gum).—Common in the good upland soils in southeast Missouri. The wood is light and not liable to split.

Liquidamber styraciflua (sweet gum).—This is one of the finest forest trees of southeast Missouri. It is very large in the moist rich soils of that part of the state. The wood is fine grained, reddish, marked with dark bands, and receives a fine polish. It is used for veneering and other cabinet work.

Nyssa aquatica (sour gum).—In swamps of southeast Missouri.

HACKBERRY.

Celtis occidentalis (American nettle tree, or hackberry).—It grows in rich soils in all parts of the state.

Celtis crassifolia (thick leaved celtis or hackberry).—In rich soils. The timber of these trees is but little used, except for firewood and fences.

The European nettle tree, very similar to the American, is used for a great variety of purposes. In Italy and south of France it is a favorite shade tree. The wood is hard, tough and compact, and much used for carved work, cisterns and tubs, musical instruments, carriages, etc.; and the branches and shoots are extensively employed for hay-forks, whiphandles, canes, ramrods, and all similar articles; the bark for tanning, and the root for dyeing. Our tree might be equally useful.

HAZLE.

Corylus Americana (American hazle).—In thickets on rich soils. The stems are very tough and elastic, and the fruit is excellent.

HAW.

Viburnum lentago (black haw).—In thickets and on the borders of streams. The fruit is good, and the shrub ornamental.

RED HAW. (See thorn.)

HERCULES' CLUB.

Aralia spinosa (Hercules' club, or angelica tree).—This curious, spiny shrub is found in Cape Girardeau county, and southward. Very ornamental.

HICKORY.

Carya tomentosa (white, common or mockernut hickory).—On good upland soil. The fruit is excellent.

Carya olivæformis (pecan).—In rich bottoms. This is one of our largest trees. It yields an abundance of the favorite pecan nuts.

Carya sulcata (thick shellbark hickory).—A large tree in rich bottoms. It produces the largest nuts of all the hickories.

Carya alba, squamosa] (shellbark or shagbark hickory).—Common on good upland soils. It produces an abundance of excellent nuts.

Carya porcina (pignut hickory).—On the best soils. The nuts are small and bitter-sweet.

Carya amara (bitter-nut hickory).—In the southwest. Very rare. It has a small nut with thin shell and bitter kernel.

Carya microcarpa (black or bullnut hickory).—Common on poor rocky ridges with blackjack oaks. It has a small nut with a thin shell and bitter kernel. Hickory is one of the most popular woods for fuel. It is much used for fences, and for wagons, carriages, farming implements, and all purposes where a hard, strong timber is needed. The young trees are cut in great quantities for hooppoles and walking sticks. The best varieties of the timber are very abundant in all parts of the state. Charcoal from hickory is very heavy, and nearly as valuable as that from birch and alder.

HOPTREE.

Ptelea trifoliata](hoptree or shrubby trefoil).—In northeast Missouri and St. Louis county.

HOP.

Humulus lupulus (hop).—This plant is common on the borders of fields, and on the banks of streams. It is very much at home for a foreign plant.

HYDRANGEA.

Hydrangea arborescens (wild hydrangea).—This is a very common low shrub on coal shaded rocky banks, near springs and streams. Ornamental.

HONEYSUCKLE.

Lonicera parviflora (small honeysuckle).—Common on rocky hill sides.

Lonicera grata (?) (American woodbine)—Not so common as the last. Both are very ornamental vines.

HORNBEAM.

Ostrya Virginica (hop hornbeam.)—This is a very common small tree on rocky hillsides and on the borders of streams. The wood is hard, firm-grained and strong.

Carpinus Americana (American hornbeam, or iron wood.)—On borders of streams and thickets; rather rare.

HOLLY.

Ilex opaca (American holly.)—This beautiful showy evergreen is very rare in the state. I have observed it in but one locality in Cooper county. Highly ornamental.

Ilex decidua.—This species of holly grows in the rich, moist bottom lands.

ITEA.

Itea Virginica (itea.)—I noticed this in Pike county.

IRON WOOD. (See hornbeam.)

JUDAS TREE.

Circis canadensis (Judas tree, or red reed.—This beautiful little tree grows everywhere in this state.

LINDEN. (See basswood.)

LOCUST.

Gleditschia triacanthos (honey locust.)—Common in rich soils both in the bottoms and on upland. The wood is hard, durable, and high colored; it is used for rails and fire wood only, but it might be made useful in many kinds of cabinet work.

Gleditschia monosperma (water locust.)—In the swamps of southeast Missouri. This tree is similar to but not so large as honey locust. I am not aware that the wood has been put to any mechanical use.

Robinia pseudo acacia (common locust.)—This beautiful tree is generally cultivated throughout the state as a shade tree. It appears

to be a native in many localities. The wood is hard, strong and durable. It is very useful wherever hardness, durability and strength are desired.

LEAD PLANT. (See false indigo.)

MAPLE.

Acer dascycarpum (white or silver maple.)—This beautiful tree is common on the banks of streams, where it usually leans over the water. This tree is easily cultivated. It grows rapidly and makes a fine, clean shade tree. The wood is white, and soft, and perishable.

Acer rubrum (red maple, swamp maple.)—A rare tree in Missouri, though abundant in a few localities in southeast part. It is ornamental, and well deserves cultivation for its beauty and rapid growth. Its sap is nearly as saccharine as that of the sugar maple.

Acer saccharinum (sugar maple, rock maple, and sugar tree.)—On good moist soils, both upland and lowland, the timber is hard, fine-grained and strong, and is used in cabinet and other ornamental work. Its sap is rich in saccharine matter, and is much used for the manufacture of sirup and sugar, which are greatly esteemed for their peculiar delicious taste and odor.

MOON SEED.

Menispermum canadense (moon seed.)—Common in lowlands. Ornamental.

MULBERRY.

Morus rubra (red mulberry.)—Common on good soil, though not abundant. The red mulberry is an elegant shade tree which produces an excellent fruit, and whose wood is hard, strong and durable.

NINE-BARK. (See spiraea.)

NETTLETREE. (See hackberry.)

OAK.

First division: Leaves lobed, lobes rounded.

Quercus alba (white oak.)—Common and abundant on the poor ridge soils. It is a noble tree, and one much esteemed for its strong, durable timber, which is much used for fences, buildings and agricultural implements.

Quercus obtusiloba (postoak.)—This oak is common on the poorer ridges, where it is never so tall as the white oak. Its timber is much sought for for all purposes where strong durable wood is needed. It is much used for railroad ties.

Quercus macrocarpa (bur oak, over-cup oak.)—In low, rich soils; timber large and excellent.

Second division: Leaves coarsely toothed.

Quercus bicolor (swamp white oak.)—In rich soils.

Quercus prinus (chesnut white oak.)—In rich bottom lands.

Quercus monticola (rock chesnut oak.)—On dry, rocky soils.

Quercus acuminata (chesnut oak or yellow oak.)—On rocky ridges and bluffs.

Quercus prinoides (dwarf chesnut oak, or chinquapin.)—On rocky hill sides, particularly in the southwest.

Third division: Leaves entire.

Quercus imbricaria (laurel oak, sometimes erroneously called pin-oak.)—Common on the rich borders of prairies, and near water courses. It is usually a small tree. Its timber is but little used.

Quercus Phellos (willow oak.)—In the rich bottoms of southeast Missouri.

Fourth division: Leaves lobed, and lobes mucronate.

Quercus heterophylla (Bartram's oak.)—In several localities in Cooper and Pettis counties. The trees very fully agree with the descriptions of Michaux.

Quercus nigra (blackjack oak.)—On upland soils. The timber of this noble tree is strong and durable; its inner bark furnishes the quercitron of the dyers.

Quercus coccinea (scarlet oak.)—On good soils. This oak derives its name from the deep scarlet color assumed by its leaves in the fall after frost. This tree is usually called black oak in Missouri. It grows with white and black oaks and shellbark hickory, on upland soil.

Quercus rubra (red oak.)—This tree is not so abundant as some other species of the oak. It grows on damp, rich soils.

Quercus palustris (pinoak, swamp oak.)—In low, wet lands.

Quercus falcata (Spanish oak.)—In good soils, but rather rare.

Quercus ambigua (gray oak.)—Rare in the central counties.

Some one or more of the foregoing species of oak is found in every forest in the state. The trees grow very large and will furnish an almost inexhaustible supply of superior timber for many succeeding generations. The oak furnishes nearly all the rails and lumber used for frames, weather-boarding, boards and shingles of wooden buildings.

OSAGE ORANGE.

Maclura aurantica (Osage orange.)—I saw this tree in the valley of Spring river, Newton county, which appeared to be native growth.

PAWPAW.

Asimina triloba (pawpaw.)—In rich, moist soils. The large purple flowers, long leaves and large, rich fruit, render this small tree singular and ornamental.

PERSIMMON.

Dyospyros Virginiana (persimmon.)—Common in glades, old fields and pastures. The fruit of this small tree is a great favorite in all parts of the state.

PINE.

Pinus mitis (yellow pine.)—On sandy ridges in the south part of the state. The timber is excellent; much of it is cut and sent to the St. Louis market, where it is manufactured into flooring. In the pine regions it is used for all parts of wooden buildings.

PLUM.

Prunus Americana (wild plum.)—Common on the borders of rich prairies and moist, rich bottoms. The fruit is large and good.

Prunus Chicasa (Chickasaw plum.)—Rare in southern Missouri.

POPLAR. (See cottonwood and tulip-tree.)

PRICKLY ASH.

Zanthoxylum Americanum (prickly ash.)—In wet places on the borders of prairies and the banks of streams.

RATAN VINE.

Wistaria frutescens (ratan vine, wistaria.)—Rare in the rich bottoms of southeast Missouri. This magnificent vine, with its showy racemes of large purple flowers, is extensively cultivated, and is often erroneously called Virgin's bower.

ROSE.

Rosa setigera (prairie rose.)—Very showy on the borders of rich prairies and in open forests.

Rosa lucida (dwarf wild rose.)—In dry prairies.

Rosa rubiginosa (sweet brier.)—Rare by roadsides and fields.

RASPBERRY.

Rubus strigosus (red raspberry.)—On borders of fields and forests.

Rubus occidentalis (?) (black raspberry or thimbleberry.)—I have seen a few plants like this; whether the same I am unable to say.

STRAWBERRY BUSH. (See burning bush.)

ST. JOHN'S WORT.

Hypericum.—One beautiful shrub of this genus is common in the rocky beds of dry branches.

SPICE BUSH.

Benzoin odoriferum (?) (spice bush.)—In rich, damp soils, ornamental.

SASSAFRAS.

Sassafras officinale (sassafras.)—This tree is common on poor soil. Medicinal. The tea made from the root is esteemed an excellent alterative in the domestic catalogue of "art drinks."

SUMACH.

Rhus copalina (dwarf sumach.)—Common on the borders of prairies and fields. The leaves of this beautiful shrub are used by the Indians with or as a substitute for tobacco.

Rhus glabra (smooth sumach.)—This handsome bush grows on the borders of prairies and fields and in thickets in open forests. The large bunches of crimson berries are very showy. They are acid, and are used for various purposes in domestic economy and medicine.

Rhus typhina (stag's hour sumach.)—This is the largest species of sumach. It grows in patches in rich soils on the borders of forests, fields and woods. The leaves and bark are used in tanning. The root is a popular remedy in fevers.

Rhus aromatica (fragrant sumach.)—This low, straggling bush is common in dry, open forests. It is cultivated in Europe for its agreeable fragrance.

Rhus toxicodendron (poison ivy.)—This poisonous vine is common in all parts of the state. In the rich bottoms it grows to a large size, and climbs to the tops of the highest trees.

SPIRAEA.

Spiraea opulifolia (nine-bark.—This beautiful shrub grows common on rocky banks and bluffs and in the beds of dry branches. It is easily cultivated, and may be propagated by cuttings.

SERVICE BERRY.

Amelanchier canadensis (shad bush, June berry, June pear, sugar pear, or swamp pyrus.)—This highly beautiful shrub is common on our rocky ridges and bluffs, while it is conspicuous in early spring for its clouds of white blossoms.

STAFF-TREE.

Celastrus scandens (staff-tree, waxwork.)—This highly ornamental

vine is quite common in rich, shaded soils. It climbs over rocks, fences, shrubs and trees. The clusters of scarlet seeds, pendent from the orange capsules, are rich ornaments of the autumnal and winter forests It is easily propagated by seeds or layers.

SYCAMORE. (See button-wood.)

THORN.

Cratægus tomentosa (black thorn.)—In rich, wet soils. This thorn grows to a large size, and has large bunches of large, white flowers and crimson berries.

Cratægus coccinea (red haw or scarlet thorn.)—Common on the borders of prairies and forest glades.

Cratægus punctata (dotted thorn.)—This beautiful shrub is common in the same localities as the last.

Cratægus crus-galli (?) (cockspur thorn.)—Glades and borders of prairies. This is probably our best hedge thorn.

Cratægus cordata (Washington thorn.)—This is one of our most abundant and beautiful thorns. There are, doubtless, other species in the state. They are very abundant, and make the forest glades and thickets beautiful and bright with their snowy flowers and brilliant fruit.

TUPELO.

Nyssa uniflora (*grandidentata Mx.*) (large tupelo.)—A noble tree in the swamps of southeast Missouri.

Nyssa capitala (?) (sour tupelo.)—In the swamps of southeast Missouri. The wood of the tupelos is very light and soft and hard to split. It is well adapted to the manufacture of bowls, trays and similar implements. The wood of the roots is so very light that it is used by fishermen as buoys for their nets. It furnishes the best substitutes for corks which the country affords.

TULIP TREE.

Liriodendron tulipifera (tulip tree, poplar).—This magnificent tree grows in Cape Girardeau county, and southward, where, as in Kentucky, it is wrongly called poplar. It makes an excellent lumber for finishing work in houses, the coarser portions of cabinet work, for carriages, etc., as it is soft, strong, hard to split and durable. It is sold in St. Louis under the name of "poplar." There are two varieties—one is called "yellow poplar," and the other "white poplar."

This is one of the largest trees of the temperate zone, and when covered with its foliage and grand, showy, tulip-like flowers, it is truly a monarch of the forest clothed in regal robes. It is a worthy peer of the stately magnolia.

TRUMPET CREEPER.

Tecoma radicans (trumpet flower, trumpet creeper).—This magnificent vine is common, running over the rocks and trees on the bluffs and in the rich soils in all parts of the state. It climbs to the tops of the highest trees, and mingles its large clusters of gaudy flowers with their foliage. The humming bird is particularly fond of these flowers, as they can easily seize the numerous insects drawn into their long tubes by the honeyed juices there secreted.

VIRGINIA CREEPER.

Ampelopsis quinquefolia (Virginia creeper, American ivy).—This beautiful vine is common on fences, rocks, and trees in all parts of the state. It is often mistaken for the poison ivy, but any one may easily distinguish them by remembering that the leaves of the poison ivy are divided into only three, while those of this vine are divided into five. The Virginia creeper is the most ornamental of all our native vines. Nothing can be more beautiful than an old tree or stub covered with the rich foliage of this vine. In the autumn, when its leaves change to the richest crimson, it gives its rich, gorgeous colorings to every tree, bluff and thicket over which its foliage is spread. It is easily propagated by cuttings.

VIRGIN'S BOWER.

Clematis Virginiana (virgin's bower).—This beautiful creeper is common on fences and thickets. It is a graceful vine, and its plumose appendages to the fruit are very beautiful and showy. It is easily propagated by cuttings or layers.

Clematis viorna (leather flower, rare on sandy prairies).—This vine has large, showy purple flowers, and is much more worthy of cultivation than many imported species of the virgin's bower.

WALNUT.

Juglans nigra (black walnut, very common on rich soil, both bottom and upland).—This is one of our largest trees, and its hard, dark wood is most useful in cabinet work and carpentry. The fruit is much esteemed.

Juglans cathartica (white walnut or butternut, in damp, rich soils no banks and borders of streams).—The timber is light colored, hard, firm grained and durable. The inner bark furnishes a popular remedy, and the green fruit is much used for pickles and catsup.

WILLOW.

Salix nigra (black willow).—On the margins of streams.

Salix fluviatilis (?) (river willow).—On the banks and sandbars of our great rivers.

Salix longifolia (long-leaved willow, in the same localities as the last).—There are several other species of willow in the state; one of them is much like the *humilis*, a dwarf species common on the prairies. The wood of the willow is but little used in this state. It makes a superior charcoal, excellent for gunpower. The twigs are used for tying vines and making baskets, and other similar purposes. In Europe willow-wood is extensively used for carvings and is turned into a vast variety of useful and ornamental articles.

WINTER BERRY. (See alder).

WITCH HAZEL.

Hamamelis Virginica (witch-hazel).—This curious shrub is rarely seen in moist places with the alder. It blooms late in the fall, when the leaves are falling, and ripens its fruit the next season. This plant was famous among sorcerers, and has been much used for divining rods.

CATALOGUE

SHOWING THE SIZE OF SOME OF THE TREES OBSERVED IN THE STATE OF MISSOURI

(From the unpublished notes of the gelogical survey).

Names.	Hight where measured.	Circumference.	Hight.	Locality and remarks.
Sycamore	2 feet	43 feet	65 feet	Mississippi county, an old stub. The hollow measures inside 15½ by 13 feet.
Sycamore	2 feet	38½ feet	125 feet	Howard county.
Catalpa	6 feet	10 feet	90 feet	Dunklin county, used for canoes
Cypress	1 foot	29 feet	130 feet	Cape Girardeau county.
Cypress	6 feet	18 feet	130 feet	Same tree.*
Cottonwood	6 feet	30 feet	125 feet	Mississippi county.
Pecan	6 feet	18 feet	130 feet	Miss. co. 80 feet to limbs.
Black walnut	2 feet	22 feet	110 feet	Benton county.
Willow	6 feet	24 feet	100 feet	Pemiscot county.
Tupelo	2 feet	30 feet	120 feet	Stoddard county. } Same tree.
Tupelo	6 feet	9 feet	120 feet	Stoddard county. }
White oak	2 feet	26 feet	100 feet	Howard county.
White oak	1 foot	29 feet	100 feet	Same tree.
Rock chesnut	6 feet	18 feet	110 feet	Mississippi county.
Chesnut oak	2 feet	20 feet	100 feet	Howard county.
Willow oak	6 feet	9 feet	100 feet	New Madrid county.
Water or pin oak	6 feet	13½ feet	100 feet	Howard county.
Water or pin oak	6 feet	9 feet	95 feet	Pemiscot county.
Bur oak	2 feet	20 feet	125 feet	Howard county.
Elm	6 feet	22 feet	100 feet	Pemiscot county.
Whahoo elm	6 feet	7 feet	90 feet	Dunklin county.
Tulip tree	1 foot	30 feet	110 feet	Cape Girardeau county.
Tulip tree	2 feet	27 feet	110 feet	Same tree, 90 feet to limbs.
Sweet gum	2 feet	15 feet	130 feet	Cape Girardeau county.
Linden	2 feet	23 feet	110 feet	Howard county.
Buckeye	2 feet	5 feet	60 feet	Howard county.
Buckeye	2 feet	7 feet	90 feet	Howard county.
Buckeye	3 feet	8 feet	85 feet	Howard county.
Buckeye	2 feet	9 feet	95 feet	Howard county.
Hackberry	2 feet	11 feet	124 feet	Howard county.
Spanish oak	6 feet	26 feet	90 feet	New Madrid county.
Sassafras	2 feet	9 feet	70 feet	Mississippi county.
White ash	6 feet	16 feet	100 feet	Mississippi county.
Honey locust	2 feet	13 feet	125 feet	Howard county.
Water locust	6 feet	8 feet	80 feet	New Madrid county.
Persimmon	6 feet	9 feet	80 feet	Mississippi county.
Redbud	2 feet	6 feet	30 feet	Mississippi county.
Redbud	2 feet	5 feet	25 feet	Howard county.
Wild plum	2 feet	3 feet	32 feet	Franklin county.
Wild plum	2 feet	4 feet	25 feet	Mississippi county.
Dogwood	2 feet	6 feet	45 feet	Pemiscot county.
Hornbeam	2 feet	4 feet	45 feet	Mississippi county.
Papaw	1 foot	3 feet	30 feet	Mississippi county.
Papaw	1 foot	2 feet	25 feet	Howard county.
Elder			15 feet	Mississippi county.
Prickly elder or Hercules' club.	2 feet	9 inches	25 feet	Cape Girardeau county.
Muscadine grape		9 inches	130 feet	Dunklin county.
Frost grape		22 inches	85 feet	Howard county.
River grape		27 inches	120 feet	Howard county.
Summer grape		20 inches	120 feet	Howard county.
Trumpet creeper	6 feet	18 inches	95 feet	Howard county.
Wistaria	2 feet	12 inches	75 feet	Mississippi county.
Beech	6 feet	18 feet	100 feet	Stoddard county.

*These measurements show the peculiar form of the cypress and tupelo. They are large at the ground, but contract very rapidly at the hight of four or five feet. From this point the shaft ascends to a great hight without much diminution.

DISTRIBUTION OF TREES AND SHRUBS IN MISSOURI.

BY G. C. BROADHEAD.

NORTH MISSOURI.

The flora of north Missouri is rather peculiarly distributed. Many trees and shrubs occupy particular zones. Some are very abundant in certain counties, but in others are not found at all. The following is a list of those found throughout north Missouri: Crab apple, white ash, prickly ash, blackberry (three species), bladder nut, box alder, whahoo or burning bush, button bush, common wild cherry or black cherry, cottonwood, amorpha fruticosa, Am. canescens, bitter sweet, coralberry, cornus sericea or swamp dogwood, and cornus resembling paniculata, alder, red and white elm, greenbrier (*smilax*) (several species), hackberry (two species), common hazel, cassia (two or three species), cratægus tomentosa, and several other species of cratægus; pignut hickory, shellbark hickory, and thick shellbark, yellow honeysuckle, iron wood (*carpinus*), honey locust, white maple, red mulberry, linden, bur oak, rock-chesnut oak, laurel oak, pin oak, black oak, red oak, pawpaw, plum (several species), rose (two species), raspberry, redbud, sumach (several species), poison oak, service berry (is generally rare), sarsaparilla (*menispermum canadense*), black walnut, willow (several species), red root (two species of *ceanothus.*)

The following cannot be said to be found everywhere:

Buckeye and coffee bean abound in most counties, although they are sometimes rare; bitternut hickory was observed in Atchison and a few other counties, but I have rarely seen it; the pecan abounds on Missouri and Mississippi bottoms, but is not common high up the Missouri. I observed it on Grand river only as high up as Utica. The grape resembling the muscadine (*vitis vulpina*) was observed in only a few counties. Black hickory (*carya macrocarpa*) abounds on some of the hills in the eastern and southern portions of north Missouri, but westwardly it disappears. Sugar maple occurs in most of the counties in north Missouri, although it is sometimes but rare. It abounds chiefly near the streams flowing into the Missouri, and, like the white walnut, is select in its choice of localities. In Adair county white walnut and sugar maple occur most often near streams flowing into Chariton river, but on Chariton bottoms they are rarely found. Cornus (sp. probably *circinata*) is found on Missouri and Mississippi river bluffs, in the eastern part of the state. The hop vine, cassia (partridge pea) and cassia Marylandica are occasionally found in many counties. In St. Charles county are found rosa letigera, r. lucida, r. blanda, vitis æstivalis (summer grape), v. lubrusca, v. cordifolia, v. cordata, v. vulpina, v. riparia. The following species occur in St. Charles county, and also in some other counties, viz: Cratægus tomentosa, c. coccinea, c. punctata, c. flava (?), c. spathulata, c. cor-

data, enonymus Americanus (strawberry tree or greenwood) is occasionally found in eastern Missouri; red maple was observed at one place in Callaway county; pin oak abounds on the wet bottoms and near the edges of prairies, but becomes very rare in the western part of the state; Bartram's oak (*q. heterophylla*) was observed in only three counties, viz: one tree in Shelby, one in Monroe, and one in DeKalb county. This tree closely resembles the laurel oak, the leaves, when young, appearing like those of the latter, but as they attain mature growth become lobed, and somewhat resemble those of pin oak, or both laurel and pin oak. Spanish oak occurs only in the eastern and southern portions of north Missouri; pawpaw abounds in most counties, although it is sometimes rarely seen. It is chiefly abundant on hills and bottoms near the larger rivers. Several species of plum occur, but there is a greater variety of them in the eastern part of the state.

In Warren county I observed a smooth bark rose, entirely bare of prickles. This species is often found in southern Missouri.

The bur oak (*q. macrocarpa*) is found on the bottoms throughout the state, but there is a zone in north Missouri throughout which it is found abundantly on the hills, seeming to usurp the place of the white oak. This peculiarity is confined to a line passing through Miller, Gallatin, Trenton, and a point a few miles south of Maysville and St. Joseph. South of this line it is entirely confined to the river bottoms. The only difference that I could detect in the trees was that that on the hills has a much whiter bark.

I have marked on acompanying map a limit of red cedar. Still I have heard of its occurrence at probably one locality northwest. The limit in this state cannot be governed by climate, for it is found still further north in other states.

Leather wood (*dircapalustris*) has only been found on Lost creek, in Warren county, and on a branch near Fulton, in Callaway county.

Whahoo elm (*ulmus alata*) and bumelia, north of Missouri river, occur on Missouri bluffs east of Jefferson City, in a few localities. They both abound on the magnesian limestone slopes, in southern Missouri.

Poplar, a small tree with smooth, silvery bark and leaf, was observed in Adair, Chariton and a few other northern counties.

SOUTH MISSOURI.

The following trees and shrubs occur in Iron, St. François and Madison counties: (*alnus serulata*) common alder, amorpha fruticosa, amorpha canescens (lead plant), crab apple, common ash, prickly ash, linden, red birch, blackberry (several species), bladdernut, buckeye (only in St. François), red cedar, black cherry, coffee tree (in Madison county), coral berry, dogwood (*cornus florida*), common elder, a very pretty bush, resembling prickly elder, having terminal flowers and leaves—leaves, long pinnate; white elm, red elm, whahoo elm, summer grape, frost grape (*vitis cordata*), and a grape resembling muscadine;

greenbrier (*smilax*), black gum, sweet gum (in south part of Madison), hackberry (common and smooth bark), hackberry (two species), witch hazel, common hazel, black haw, common hickory (*c. tomentosa*), shellbark and thick shellbark hickory, pignut and bullnut hickory, hornbeam, iron wood, honey suckles (vine and also probably bush or woodbine), red bud, honey locust, red, white and sugar maples, mulberry, white, burr, post, swamp, white, rock-chesnut, pin, laurel and gray oaks, pawpaw, persimmon, yellow pine and a more scrubby pine, American plum, rose (four species in St. François and Iron counties), raspberry, sycamore, sumach, fragrant sumach, sassafras, service berry, whahoo, several species of cratægus, trumpet creeper, white walnut, black walnut, spice bush (*laurus benzoin*). Pine does not occur in northern parts of these counties, but in the southern part abounds.

There is a marked line between the flora of the north and that of the south part of Madison county. In south part we found poplar or tulip tree, sweet gum, prickly elder and catalpa, which don't grow north. Leather wood occurs on Castor river, in Madison, and lower Big creek, in Iron county. Bumelia and whahoo elm often abound in southern Missouri; black gum, sweet gum and catalpa are mostly confined to southeast Missouri. Blackjack and postoak and black hickory are the most abundant trees in southwest Missouri.

MINERAL SPRINGS OF MISSOURI.

BY GARLAND C. BROADHEAD.

[Read before St. Louis Academy of Science, October 18, 1864.]

The following is a brief description of some of the most important mineral springs that have come under my personal observation:

IRON OR CHALYBEATE SPRINGS.

These have mostly been noticed as flowing from the drift, and sometimes from older formations. There are several springs at Bird Price's, on Ramsey creek, in Pike county, four of which were examined. In one a taste of iron was detected; in others no particular taste was perceptible, and on account of the marshy character of the ground it was impossible to reach them all. The water of one acts on the kidneys, another is good for dyspeptic persons. The ground here is low and flat, and no rocks in situ are found very near. The neighboring land spreads out into rich, rolling valleys, heavily timbered, which gradually merge into the surrounding knobs, which are capped with encrinital limestone, reposing on chemung rocks. Lower down, near Ramsey creek, are occasional outcrops of Hudson river shales.

In Lincoln county, near Louisville, at Mr. W. B. Sitton's, there is a pleasant tasted chalybeate spring. A brown deposit is formed on the rocks.

On Bryant's creek, near Mississippi bottoms, on lands of John Carter, are several chalybeate springs.

There are a few as yet unimportant chalybeate springs in St. Charles county. I might mention one near Naylor's and another near O'Fallon.

In the northern counties, where the sands of the drift abound, as represented in the altered drift, we often notice the waters colored by oxide of iron. Such springs are found in Knox, Adair, Sullivan, Mercer and Harrison.

In Knox county, in section twelve, township sixty-two, range ten west, is a fine chalybeate spring; the water is much esteemed as a mild cathartic and good tonic.

In Adair county the waters of some of the streams flowing through beds of coal measure sandstone, partake of a chalybeate character. The waters of Hog creek, Hazle creek, etc, have marked diuretic properties. In the neighborhood of Squire Hendrens, near Hog creek, are several chalybeate springs.

In Sullivan county, in section twenty-four, township sixty-four, range twenty-one west, there is a fine chalybeate spring; it issues from measure sandstone, is pleasant to taste, and has marked diuretic properties.

In Mercer county, in southwest section sixteen, township sixty-five, range twenty-four west, numerous springs issue from the drift sands, most of them containing much oxide of iron in solution. Quite a thick, rusty crust is deposited on the adjacent ground.

There is an excellent chalybeate spring near Mt. Moriah, Harrison county, it issues from drift sands, in which cretaceous fossils are found.

Near Smithton, in Worth county, a chalybeate spring issues from sands of altered drifts.

OTHER MINERAL SPRINGS, MOSTLY SALT AND SULPHUR.

In Ralls county are many noted springs. Buffalo lick, in section twenty-eight, township fifty-five, range seven west, issues from Chouteau limestone. A saline taste is perceptible. Forty years ago, salt in remunerative quantities was made at this place by the Messrs. Ely. Bones of buffalo are found imbedded in the marshy ground near the spring. On north side of salt river I observed a buffalo trace from two to five feet in depth, and from twenty to fifty yards wide. The waters of Buffalo lick are very healthy, and are said to be good for liver complaint. Trabue's lick, near Spencer's creek, is a mild sulphur, and probably issues from Hudson river shales. Further down Spencer's creek valley is an extensive lick; near the spring the ground is marshy, and near by it has the appearance of being licked a great deal by stock.

Fremon's lick, in section thirty-three, township fifty-six, range five west, is a strong salt sulphur spring, and many years ago salt was made here, but the settlers becoming frightened by the presence of Indians, the kettles were thrown into a well, and the works abandoned. The source of this spring seems to be Hudson river shales. The upper spring does not afford much water, but is decidedly saline. The lower one is a strong blue sulphur, much stronger than Elk lick. A gum has been placed in the spring, and on its sides, as also on the adjacent gravel, a bluish coat is formed. Cattle and horses are very fond of this water.

At Bonvit's or Trabue's lick (or as now more often called Muldrow's), there was formerly much salt made, and the owners were very well remunerated. In 1827 Mr. Trabue sold it at one dollar per bushel. The water of this spring issues out boldly from beneath the Black river limestone. Borings have been made to the depth of three hundred feet, reaching salt water. This would place its fountain head in the magnesian limestone series. Its location is in section twenty-five, township fifty-six, range six west.

The spring at Saverton, somewhat resembles Fremon's, but the water is not so strong. It issues from Hudson river shales. A dark indigo-blue deposit is formed within the gum—without is a black deposit, and in the branch a whitish deposit. Salt and sulphur are predominant.

In Pike county there are many mineral springs. Most of them contain sulphur and magnesia, etc., in combination, and they generally issue from Hudson river shales. I would mention the following as possessing valuable medicinal properties: Elk lick and Spencer's creek is very much resorted to by invalids and pleasure seekers during the summer months, and its waters are much esteemed. The three springs on Buffalo creek probably possess as valuable properties as Elk lick. Other springs are: Epsom salt spring, at Mrs. Meriwether's, and of less note are Mudlick springs (sulphur), near Louisiana and Frankfort road; Frankfort salt spring; spring on farm of John W. Davis; Lindsay's lick, and Ford's spring, on Big Ramsey, near Paynesville road.

On Mr. Thomas' land, in northwest section six, township fifty-three, range one west, at upper part of lick, are two acres of marshy ground. The water seems to contain iron; at the lower part, a sulphur spring breaks out; flinty pebbles found here are covered with a bluish incrustation. I here found a mastodon tooth; other mastodon bones have also been found here.

Mudlick occupies a wet area of about three acres, in which are two sulphur springs. Hudson river shales crop out in the spring. Cattle seem to be very fond of this water.

At Elk lick are three springs. The water is a mild, white sulphur, and very much valued for its medicinal properties. They originate in Hudson river shales.

At Mr. John W. Davis' a spring issues forth from near the junction

of the Hudson river shales and upper Trenton limestone. It contains sulphate of magnesia and iron. A brown deposit settles on the mud, and a scum on the still water in the branch. The water is clear; occasionally a slight ebullition takes place, and gas arises.

The springs at Mrs. Meriwether's resemble the spring at Mr. Davis'. It is an epsom salt, issuing from top of Trenton limestone. When stationary, a dirty scum forms on the surface; a ferruginous deposit lies on the earth around and seeming in a semi-state of crystallization. The water here is much esteemed as a diuretic.

About three-quarters of a mile above the junction of Big and Little Ramsey is Lindsay's lick, a large spring, covering an area of half an acre; it contains sulphureted hydrogen.

Ford spring, three-quarters of a mile above Lindsay's, flows out copiously—contains sulphureted hydrogen and salt.

On Buffalo creek, in southeast section thirty-four, township fifty-four, range one, west is a salt lick; several acres seem quite barren; the adjacent soil is covered with a white saline incrustation. Many small concretions of ochreous oxide of iron are found here, and bones of large animals have also been found. Lower down the creek is another sulphur spring.

There are several sulphur springs near waters of Cuivre, in Lincoln county.

Loutre lick, west of Danville, in Montgomery county, is a salt sulphur, and salt was made here during the early settlements. The water issues from second magnesian limestone.

The spring at Goreham's lick, Randolph county, is twelve feet deep and ten square feet of surface. The adjacent wet ground covers an area of about twenty square feet. The water seems to be strongly saline, and on stirring it bubbles of sulphureted hydrogen arise. This place seems to be much resorted to by animals as a lick. Much salt was formerly made here; some of the ruins are yet to be seen in fragments of post and of ashes.

Sweet spring, on Huntsville and Glasgow plankroad, in section seventeen, township fifty-three, range fifteen west, contains common salt, epsom salt, and some salt of magnesia. The water is very beneficial in some cases of ill health. Its action appears to be chiefly on the bowels, as a regulator and tonic, and is, therefore, good for dyspeptic persons. It has a sulphurous taste.

At Pearce's mill, on Moniteau, in Randolph county, a well is sunk through limstone, etc., to coal. It contains a saline water possessing cathartic properties. A whitish sediment is deposited within the steam-boiler of mill.

Spring at Jacksonville, on railroad at county line. Its taste is pleasant and slightly chalybeate. The surface of the spring presents an iridescent appearance; is good for dyspeptic persons, and I was informed that cattle, when heated, could drink large quantities with impunity. The water is used in steam-mill, and does not cement

or rust the boiler, but a white sediment is deposited. In the dryest seasons the supply of water is abundant.

Meramec springs, in St. Louis county, and Chouteau springs, in Cooper county, are much resorted to.

Salt springs occur in Howard county, at Boonslick.

In Saline county, are several large salt springs and salt ponds containing a large per centum of salt.

MANUFACTURING IN MISSOURI.

FACILITIES AND NECESSITY FOR MANUFACTURING ESTABLISHMENTS, AND THEIR RELATION TO THE AGRICULTURE AND COMMERCE OF THE STATE.

It is hardly possible that argument should be required to prove the intimate relation between agriculture and manufacture, or to show the importance of a full development of the latter for the best interests and future prosperity of the State of Missouri. And yet it would seem as if we had not made the most of our natural resources or geographical position. Measured by the standard of manufacturing progress in other of the northwestern states, we are below the average, especially if the age and opportunities of our state be taken into account.

The total value of manufactured product in Illinois for the year 1860 was		$57,580,886
Same in	Indiana	42,803,469
"	Michigan	34,658,356
"	Ohio	121,691,148
"	Wisconsin	27,849,467
"	Missouri	41,782,731

Missouri, in the ten years preceding 1860, having increased in a less ratio than any of the states above named. It is much more than likely that this is the result of slavery, through which labor was degraded and the progress of civilization, if not altogether checked, at any rate greatly retarded. It is our good fortune, however, to have outlived the institution itself, and we may hope to outlive its evils, and see that advancement made which enlightened liberal sentiments, just laws, and their wise administration are ever calculated to produce.

In the earlier periods of national growth, cultivation of the soil becomes a paramount necessity. The pressing wants of the people demand that every effort be made to produce an adequate amount of food for their consumption, while the rich soils of this western country

invite immigration on so large a scale as to tax the energies of every settler for the first few years of frontier life. During this time but few articles can be manufactured by hand labor, and these of the rudest kind. But when the surplus products begin to find a market abroad, and when the farm houses are built, fences made, and the necessary improvements completed, a surplus capital is soon obtained for commerce and manufactures; and just in proportion as these flourish, will science, literature and art shed their radiant influences around. We hold that no nation can or ought to be absolutely self-dependent. The Almighty has put his fiat against such arrogance as would result from that; but it is at the same time obvious that agriculture, commerce and manufacture can flourish together better than separate, if the conditions be at all favorable. And what better conditions can there be than those in and around Missouri? Cotton in the adjoining and even in our own state; hemp and flax, corn, wheat and tobacco at home; coal at our door; iron, copper and lead, in most parts of the state, and in such abundance as to stagger the mind in contemplating those resources. So that, whether it be a question of food for the operatives, or raw material for the mills, with power to operate them, there is hardly any spot in the world so favored as is Missouri. Nor should we forget the vast amount of wool, hides and beef to be produced on the farms of the west and southwest. Nebraska, Arkansas, Texas, and the western parts of Missouri are peculiarly adapted to sheep raising, and this branch of industry is rapidly increasing every year. The amount of wool in the home markets of the United States is altogether inadequate to the demand. Furs, peltries and hides from the west are shipped in great abundance to the east, increasing the expense of transportation by having to be reshipped back again when manufactured into articles of daily necessity in the west. The materials for manufacturing paper, glass and stoneware are to be procured within the limits of the state, and yet little attention is paid to the production of these articles. It is surprising that we have not one paper mill in Missouri, notwithstanding the enormous amount of paper consumed by the daily and weekly newspapers in St. Louis, and the various cities of the interior.

An able writer, who has contributed much to the science of agriculture, says:

"How paltry and insignificant do all our discoveries and inventions appear compared to what is in the power of the agriculturist to achieve? All our advances in arts and sciences are of no avail in increasing the conditions of human existence, and though a small fraction of society, by their means, be gainers in material and intellectual enjoyment, the load of misery remaining upon the great mass of the people remains the same. A hungry man cares not for preaching, and a child that is to learn anything at school must not be sent there with an empty stomach. Every step made in advance by the agriculturist serves to alleviate the sufferings and troubles of mankind, and to make

the human mind susceptible and capable of appreciating the good and the beautiful that art and science present to us. Improvements in agriculture constitute the only solid foundation for further progress in all other branches of knowledge."

This beautiful tribute to agriculture will be appreciated by every thinking man, ennobling as it does the labor of the tiller of the soil, and raising the agriculturist to his proper position—the front rank of civilization. Let the soil cease to yield its abundance and we are at once grasped in the embrace of chaotic ruin; stagnation of trade, famine, pestilence and death result. In the past history of nations, as well as in the present, none have risen to power in the first rank except those in which agriculture flourished most. It is the key of success to power and prosperity. It is the corner-stone of national greatness—the reservoir of all that is good, and great and noble in our race.

The geographical situation of Missouri, and the surrounding climatic influences, too, are peculiarly favorable for both agriculture and manufactures. The noble Mississippi, with its constant sweep of current toward the tropics, bathing the eastern boundary of our state, furnishes a cheap highway for the exchange of food and products between the north and south, while its tributaries open paths for thousands of miles to reach the interior of states and territories, enabling us to extend the light of intellectual life and courage to the savage now chained in his barbarian struggles. Our system of railroads connect us by three direct routes with the east; and with the south and north we have land carriage to every accessible point; while, ere long, we shall be in unbroken communication with the Pacific coast. The bright orient will send its rich treasures through our state on their way to the marts of the world, and St. Louis must then become one of the most affluent of cities—a halting place midway across the continent.

Judging by the central position of our state, the rich inexhaustibility of her soil, her forests of soft and hard wood, her extensive mines, her water and land communications, her water and coal power, it would seem as if the hand of Providence had marked a future of glorious destiny for Missouri. We need only enterprise to put into operation schemes of manufacturing industry on a large scale. Almost all the capital necessary we have at home; but if more be needed, with properly directed energy it could readily be obtained from abroad. Here is the spot on which millions of untold wealth may be realized, and where millions of happy mechanics may pass their lives amidst a bounteous plentifulness of all that can make life worth having.

That we may not despair of our future, but in order to stimulate activity, we will turn to a few facts and figures in connection with the important subject of manufactures.

"Coming events cast their shadows before them." When the British board of trade, at its sitting in 1732, reported their conviction that, unless restrained, the colonies would become manufacturers for

the world, New England, New York, Connecticut, Rhode Island and Pennsylvania had fallen into the manufacture of woolen cloth; hemp and flax they manufactured into coarse cloth, bags, traces and halters; some iron was manufactured in Massachusetts; brown holland, shirting and paper, nails, bar iron, hollow-ware, etc.; ships were said to be "built for the French and Spanish;" hats exported to Spain, Portugal and the West Indies; several still-houses, sugar refineries, etc., existed. The mother country felt jealous; and acting upon her jealousy, to the manifest injury of the colonies, in 1750 she forbade the Americans to work in iron, and Lord Chatham declared in parliament that the colonies had not the right to manufacture a nail. But the laws which govern all such matters could not be arrested either by force of arms or acts of parliament. The manifest tendency of all things is toward economy; and Americans, with their energy, spirit and inventive faculties, have now built up manufacturing establishments that promise to rival those of Europe.

It is just one hundred years since machinery was first applied to the spinning of cotton. Prior to that time all the spinning was done by hand labor, with the aid of the old spinning wheel and loom, precisely as is now the case in remote settlements in the west. Hargraves, in 1767, and Arkwright, in 1769, brought out the spinning jenny; and at that time Great Britain possessed neither the labor nor the skill trained to the work, nor the machine builders, nor the raw material, and yet, within four years from that time, the business was in successful operation. How it has been steadily progressing is well known, for the British manufactories control the markets of nearly every nation, and the wealth derived therefrom would appear fabulous were we not accustomed to such astonishing revelations in these latter days.

In the year 1791, the first cotton mill was erected in Rhode Island; in 1795, another in the same state; and two more in Massachusetts in 1803–4. In 1808, fifteen in all were in operation, working about eight thousand spindles. In 1809, eighty-seven mills were erected, requiring eighty thousand spindles, and a capital of $4,800,000. The amount of cotton used was 3,600,000 pounds, and persons employed, 4,000. There were also fourteen woolen mills in operation; and President Washington delivered his message to Congress, in 1790, in a suit of broadcloth manufactured in Connecticut.

The eastern people have perfectly understood both the power and profit of manufactures, and have steadily prosecuted their work. The census returns for 1860 show 1,091 cotton mills in the United States; capital invested, $98,585,269; amount of raw cotton used per annum, 422,704,975 pounds; number of hands, 122,028; aggregate of spindles, 5,235,727; value of cotton goods manufactured, $115,681,774. Of these figures upward of seventy per cent. of the capital invested, more than sixty-eight per cent. of the entire product, nearly seventy-eight per cent. of the printing cloths, and seventy-five per cent. of the whole quantity of cloth made, as well as a principal part of the web-

bing, quilts, seamless bags, lines, twine, etc., were returned from the New England states. The total value of the woolen manufactures of New England is sixty-five per cent. of the aggregate for the whole country. One-half of the total value of paper made is produced in the New England states. In other manufactures the same disparity exists between New England and the rest of the states. The indomitable energy and perseverance displayed result in an annual value of manufactured products in New England of $468,599,287; the total manufactured products in the western states, $384,606,530. The wealth of Great Britain, as well as her steady growth during the present century, have been the result of her manufacturing system, and chiefly of cotton.

The report of the British board of trade for 1864 presents the following results: "Of the two hundred and forty-nine million pounds sterling worth of goods we imported last year, two-fifths consisted of materials for our manufactures, of which amount fully one-half consisted of cotton, and rather less than one-half of wool, silk, flax and hemp, hides, oil and tallow, metals, indigo and saltpetre. The other great branch of our imports consists of food and stimulants, or luxuries for the subsistence of our people, and forms nearly one-third ($375,000,000) of our whole imports. Of this, one-half consists of the necessaries of life—grain and flour, bacon, butter, cheese and rice; the other half what may be called luxuries—sugar, tea, coffee, wine, spirits, tobacco and fruit. The remainder of our imports consists of wood for house and ship building, furniture, manufactured articles of dress, etc. We import twice as much cotton as corn (grain), and twice as much grain as wool. Of the $732,500,000 worth of goods which we sold to other countries last year, fully two-thirds consisted of articles manufactured by us out of foreign materials—the cotton goods alone amounting to $237,500,000, and less than one-third of materials of our own production (raw or manufactured), chiefly metals and coal. Cotton goods form the largest portion of our exports, and next to them metals and metal goods, the former constituting one-third and the latter one-fourth of the whole of our exports. We export twice as much cotton goods as woolen and twice as much woolen as linen. The total value of metals and metal goods exported last year was $165,000,000, but we cannot claim all this as the produce of our own materials, seeing that we imported $20,000,000 worth of metals (chiefly copper) from other countries."

Here it will be seen that both the raw material and the food for the operatives have to be imported into Great Britain, carried thousands of miles before reaching their destination, and after the material is manufactured the goods are again shipped abroad, making of Great Britain "a workshop, which diffuses its fabrics equally over the frozen or the torrid zones; which clothes alike the negroes of the West Indies, the laborers of Hindoostan, the free settlers of Canada, the vine growers of the Cape, and the sheep owners of New Holland and

Van Dieman's Land. The rapid increase of the human race in these advanced posts of civilization sustains and vivifies the empire, notwithstanding all the burdens consequent on her political situation; and in spite of the prodigious increase in the power of machinery, has called into being an enormous and perilous manufacturing population."

In estimating the comparative value of cotton raising and cotton manufacturing, statisticians find this result: In producing cotton, $153 46 per hand is earned per annum; in manufacturing the same article, $491 69 per hand is the amount of product, being less by $338 23 per annum for each hand employed in the production of cotton than is realized by its manufacture.

The same arguments which apply to cotton will apply to most other manufactures. The iron interests of Great Britain are among her most important; and the iron interests of Missouri ought to be more vast than in any portion of the world, if estimated by her natural resources in ore. Our metalliferous region covers an area of twenty thousand square miles, and the same formation extends southward into Arkansas and westward to the Indian territory. The whole region is composed of the lower magnesian limestone. It is uniform in its mineral character, as unusual as the great extent of its deposits, and bears lead throughout the entire extent. The iron ore is massive, and is found near the surface, and is of great purity. Iron mountain, eighty miles from St. Louis, is a wonderfully compact deposit of solid ore. It covers an area of five hundred acres, rises to a hight of two hundred and sixty feet, and is estimated to contain over two hundred millions of tons of ore. Pilot Knob and Shepherd mountain have likewise obtained world-wide celebrity on account of the value and the enormous amount of metal contained in them. These deposits alone are sufficient to supply the markets of the world for centuries to come.

Missouri is situated between 36° and 40° 30′ north latitude. Its length is 270 miles and its breadth 220. It contains thirty-eight million acres. The Mississippi bounds its eastern frontier, and the state lies about midway of the length of this river. The basin of the Mississippi drains 1,200,000 square miles, and it embraces a soil and climate so varied as to yield the greatest diversity of products. To this area nature has been prodigiously bountiful, and with a lavish hand she has distributed all those physical circumstances which make nations great.

No other part of the world seems to be so specially favored. The northern half, with its food, products and minerals; the southern, with its cotton, sugar and hemp, and both with their means for land carriage and water communication. Reciprocally interested they appear to be wedded for economy, happiness and usefulness to mankind; and Missouri, lying between the extremes, becomes the natural bond of their union. The north is abundantly able to furnish food to those

who produce the raw material for manufacture, having still sufficient left for mill operatives at home; and all the varieties of the temperate zone can readily be exchanged for tropical productions, each furnishing freight for our magnificent river craft. Dwelling in the regions of North America the highest energies of man are called forth. Here he is compelled to be diligent, to labor, to be provident, to gather into barns, to study the great book of nature, to observe her laws, and while it is summer to take thought for the winter. Taught economy by the surrounding circumstances, the field, the forest and the mine become his great sources of wealth. By economizing our hills of iron, our valleys of coal, and our fields of cotton for home industry, the just rewards of labor are preserved to our own region. Here we ought to spin the thread and weave the fabric, and build the ships to transport our wares, instead of exporting the raw material, with the food along with it, for the European and eastern operatives. As long as we have food our population will be governed by the law of increase, which is to double every twenty-five years; and each man who aids in providing for the community of interests to spring up in the immediate future, when the demands of a vast population for labor and food, and a diversity of employment will be so great, should be esteemed a benefactor in the highest meaning of that word.

There are eleven agricultural states, which are now distinguished by their fertility and productions, lying in the Mississippi valley, all above thirty-six degrees of north latitude, and which, at no distant date, must contain the population, as they at present do the resources, to control the destinies of the North American continent. These states are Ohio, Indiana, Illinois, Missouri, Kentucky, Wisconsin, Iowa, Michigan, Minnesota, Kansas, and Nebraska.

The aggregate population of these eleven valley states in 1860, was 10,445,580—33½ per cent. of the total population of the Union. Their real and personal property was valued at $4,519,263,737—31.87 per cent. of the total wealth of the nation, slaves excluded. The cash value of their farms was $2,462,350,921—37.05 per cent. of the total. In farming implements and machinery they had $80,275,535—32 per cent., and of live stock $382,405,994—35.1 per cent. of the whole.

The agricultural products and their value and proportion in 1859, were:

Kind.	Quantity.	Proportion to product of the nation.
Wheat	102,398,994 bushels	59.1 per cent.
Indian corn	470,190,097 bushels	56.0 per cent.
Rye	5,160,418 bushels	24.4 per cent.
Oats	67,567,707 bushels	39.1 per cent.
Tobacco	173,758,747 pounds	40.0 per cent.
Wool	25,231,830 pounds	41.8 per cent.
Slaughtered animals	$81,800,333	34.8 per cent.
Hay	7,219,957 tons	37.8 per cent.
Butter	164,785,997 pounds	35.8 per cent.
Irish potatoes	36,759,891 bushels	33.2 per cent.
Wine	955,717 gallons	59.0 per cent.
Hemp	67,555 tons	00.7 per cent.

Reducing the flour and meal to bushels, the total exports of grain from the United States to foreign countries during the years 1862 and 1863, were for the former $83,692,812, and for the latter $88,597,064. Great Britain, in 1863, of the above bought $56,059,360. The total shipment of grain for the east from the ports of Lake Michigan, in the year 1863, was 74,710,664 bushels.

In the New England states the total amount of wheat, corn, barley, rye, oats, buckwheat, peas and beans raised, in proportion to the population, in 1850, was 8.11 bushels per head; in 1860, 7.92 bushels, showing a decrease of .18 of a bushel. The same in the middle states for 1860, 25.33 bushels, having fallen off since 1850 about one bushel per head. The same for the eleven western states, was 62.96 bushels per head, showing an increase in ten years of three bushels to each inhabitant. Of the surplus of grain and farm products in the west, besides the shipments to foreign countries, a large portion found a market in the southern states, but a much larger supply was furnished to the eastern manufacturing states, as New York and New England together, in 1860, required twenty-six millions of bushels of wheat, in addition to their own production, to meet the demands of consumption. This demand for consumption would be easily accounted for if we could compile a table of eastern manufactures. The following paragraph will, however, sufficiently illustrate how the matter stands:

"MANUFACTURES IN CONNECTICUT.—Among the manufacturing centers of Connecticut, New Haven has $3,936,655 invested in manufactures, employing 4,339 males and 3,315 females, and produces goods valued at $5,283,435 annually. Waterbury has invested $2,736,000, employs 1,662 males and 840 females, and produces annually goods worth $3,853,875. Bridgeport has $1,466,400 invested, 2,150 males and 1,119 females employed, and produces $5,573,920 worth of goods. Hartford has invested $2,583,200, 2,275 males and 1,760 females employed, and its products are valued at $5,283,435. Norwich has invested $2,493,750, employs 1,674 males and 1,399 females, and produces $3,572,870 worth of goods annually. New London has invested $1,379,200, employs 1,670 males and 201 females, and produces $2,166,589 worth of goods."

Now, it must be plain to every mind that if the manufacturing population could be induced to settle where the food is raised, the farmer would be saved the cost of distant transportation for his products; he would be enabled to raise a greater variety of crops for a home market, many of which cannot be exported at all; he would keep in his own state the offal and refuse for the purpose of manuring and improving his soil, while the profits of manufacturing would add to the wealth and importance of the west.

The following is the value of the products of twenty-four classes of mining, manufacturing and mechanic arts, as given in the preliminary census of 1860, and the compendium of 1850:

Year 1860. 11 western states	$217,476,446
" 1850. " " "	105,461,612
Increase in 10 years, (106, 2 p. c)	$112,014,834
Year 1866. 12 New England and middle states	$703,255,086
" 1850. " " " "	432,044,209
Increase in 10 years (62.7 p. c.)	$271,210,877

The following is the approximate value of all products of mining, mechanics, and manufactures:

Year 1860. 11 western states	$390,411,942
" 1850. " " "	171,022,976
Increase in ten years (128.2 per cent)	$219,388,966
Year 1860. 12 New England and middle states	$1,298,207,058
" 1850. " " " "	746,715,814
Increase in ten years (73.8 per cent)	$551,491,244

The "manifest destiny" of the west is here shown. Manufacturing, on the most extensive scale ever realized in the history of the world, is as sure to be secured in the west as night is to follow day. It remains to be seen whether Missouri will contend for the golden prize. The age, wealth, dense population and skilled industry of the east are no match for the powerful resources of the west. In Missouri we have the heart of the nation; we possess the key of the door of the future, and the hight of our glory will be achieved when, on the banks of the Mississippi, our mills turn out the fabrics needed in the West Indies and South America; when steam engines and machines are built for exportation; when our lead, copper and iron are turned into articles of daily use in civilization; when mills convert our waste cotton and rags into paper; when printed books shall go hence to become familiar friends by the winter fireside; or when our literature shall charm poetic fancy in the shady groves of the tropical regions. Our flour and meal furnish the daily food of the plantation laborer, and our sawed and planed lumber ought to shelter him in his domestic quiet. With cheaper clothing, and boots and shoes, an addition will be made to human happiness; and furniture, musical instruments, jewelry and silver ware, pictures and statuary, when placed within the reach of the diligent, will adorn and grace the outgrowth of culture on the ruins of a modern barbarism faded, or fast fading before us.

A question has often been raised as to the profitable use of coal or water power in manufacturing. We have many water powers in this state which might be advantageously used; yet by the light afforded it is evident that coal is the most useful and economical in the long

run. Wherever that article is abundant and cheap, manufacturing has never failed to exist and prosper. The great manufacturing cities of Great Britain are in the immediate vicinity of her coal fields.

Birmingham, in 1801, had a population of 73,670; in 1860 it had 295,955. Its growth is entirely due to manufacture of hardware, and it is in the midst of a deposit of iron, coal and stone.

Manchester, in 1801, had a population of 95,313; in 1860 it had 357,604. This city is on the edge of a large coal field, and the power obtained applied, to the steam engine, has made Manchester the largest cotton manufacturing city in the world.

Leeds, in 1831, had a population of 71,602; it had in 1860, 207,153. Its woolen manufactories are due to coal fields in the immediate neighborhood.

Sheffield had, in 1801, 45,755 inhabitants. In 1860 it had 185,157. Iron and coal at Sheffield have made its cutlery celebrated everywhere.

An abundant supply of coal furnishes a regular and never varying amount of power. The steam engine is easily controlled; it is neither affected by floods, nor by frosts, nor by droughts. It is absolutely subjected to the will of man.

Not so, however, with water power. The capricious atmosphere sometimes withholds the precious rain until the parched earth yawns and the water courses are drained. At others, the rain falls incessantly for weeks, causing the streams to overflow the banks, submerging hundreds of miles of country. The melting snows in the mountains affect us to an alarming extent about once in seven years. Neither bridges nor dams, nor floodgates can withstand the pressure of the water when the north pours out its torrents suddenly in the spring.

But whether we regard power as from water or from steam; whether it come from the muscles of the horse, or the physical strength of man—in every case it is but a manifestation of Divine agency. And he who can most conserve the forces of the material world, and make them tributary to man's happiness, bequeaths to posterity a name to be honored through all time.

Ages ago the energies of the sun were conserved in the building of huge forests, whose buried trunks and limbs were garnered for our use. Then chaos seems to have ruled on earth; but amidst chaos, the foundations for future power were laid, and a state of inorganic nature favorable to man's existence was prepared. From the earliest time, when conjecture alone can figure an idea to the mind, the same correlations and conservations have existed. The same forces of air and water and heat are forever in operation. The sun's relationship to life is filled with sublimity and grandeur, and in contemplating his potency we are brought nearer to the Divine Creator.

The real manufacturer and the real agriculturist is the sun. By his grace and bounty the trees are formed, the meadows grow, the grain

is filled, and the flowers bloom. The vegetable world is the source mediate or immediate of all animal life; and so surely as the sun produced for us the heat which we derive from the coal, so surely did he first lift the vapor from the valleys to the mountain tops, and secure to us water power for our use.

The farmer may dwell in rapt admiration amidst the wonders of his fields, yet the artisan can revel in contemplations of truth and poesy while his machinery is performing its labor. The farmer realizes that

Carbonic acid, Hydrogen, Ammoniacal salts,	} Feed vegetation.
That—plants produce neutral azotised substances, Fatty substances, Sugar, starch and gum,	} Animals consume neutral azotised substances, Fatty substances, Sugar, starch and gum.
Plants decompose carbonic acid, Water, Ammoniacal salts,	} Animals produce carbonic acid, Water, Ammoniacal salts.
Plants disengage Oxygen.	} Animals absorb Oxygen.
Plants absorb Light, heat and electricity.	} Animals produce Light, heat and electricity.

Reduction is effected by plants;
Oxydation is effected by animals.

Plants are stationary;
Animals are locomotive.

These correlations teach the way to others neither less interesting nor less valuable, and both hold out for man's guidance that economy rules in the natural world, and that law governs the universe.

By conserving and economizing the dormant forces around us, we are only copying from the book of nature. Applying them as agents to supply mankind with necessities, or even luxuries, we are aiding in the drama of life whose aim is to arrive at the ultimate happiness of our race. To us it is immaterial whether our fabrics are produced by hand labor or by machine power; a piece of cloth weaved by the power loom is as valuable as the product of the human hands, with this addition, that just in proportion as we obtain labor from the machine we are lessening the load of human toil and suffering. With every engine in our midst we are adding to our productive energy—our national power and greatness—without making a violent drain on our population. Machine power is easier applied to manufacture than to agriculture. The force obtained through steam does not drain our resources as much as the force required for agricultural labor. A horse power is equal to five men, and therefore every engine of two hundred horse power gives a force in the community equal to one thousand adult persons, without requiring the provisions necessary for their existence and comfort. The vast increase of population in Europe, and in those countries peopled

by European descendants, is, in part, owing to the introduction of machinery and its application to the mechanic arts. Every stroke of the piston-rod, and every revolution of the driving wheel, tends to ameliorate the sufferings of humanity. Contrasted with the past, our present condition is so noble and so glorious as to stimulate to the highest degree every human faculty to produce a still greater advancement for posterity.

In blending manufactures with agriculture, a harmonious result is sure to follow; and as the conditions are so vast and the opportunities so great, we shall hope to see Missouri take her proper place as the empire state of the west—a leader in the van of scientific and social progress.

In this connection, we copy the following from one of the best thinkers and wisest natural philosophers of the age:

"In the plant, the clock is wound up; in the animal, it is run down. In the plant, the atoms are separated; in the animal, they recombine. And as surely as the force which moves a clock's hands is derived from the hand which winds up the clock, so surely is all terrestrial power drawn from the sun. His warmth keeps the sea liquid and the atmosphere a gas, and all the storms which agitate both are blown by the mechanical force of the sun. He lifts the rivers and the glaciers up to the mountains; and thus the cataract and the avalanche shoot with an energy derived immediately from him. Thunder and lightning are also his transmuted strength. Every fire that burns, and every flame that glows, dispenses light and heat which originally belonged to the sun. In these days, unhappily, the news of battle is familiar to us, but every shock and every charge is an application, or misapplication, of the mechanical force of the sun. He blows the trumpet, he urges the projectile, he bursts the bomb.

"And remember this is not poetry, but rigid, mechanical truth. He rears, as I have said, the whole vegetable world, and through it the animal; the lilies of the field are his workmanship, the verdure of the meadows and the cattle upon a thousand hills. He forms the muscle, he urges the blood, he builds the brain. His fleetness is in the lion's foot; he springs in the panther, he soars in the eagle, he slides in the snake. He builds the forest, and hews it down; the power which raised the tree, and which wields the axe, being one and the same.

"The clover sprouts and blossoms, and the scythe of the mower swings by the operation of the same force. The sun digs the ore from the mines, he rolls the iron, he rivets the plates, he boils the water, he draws the train. He not only grows the cotton, but he spins the fiber and weaves the thread. There is not a hammer raised, a wheel turned, or a shuttle thrown, that is not raised, and turned and thrown by the sun. His energy is poured freely into space, but our world is a halting place where this energy is conditioned. Here the Proteus works his spells; the self-same essence takes a million shapes and hues, and finally dissolves into its primitive and almost formless form.

"The sun comes to us as heat; he quits us as heat; and between his entrance and departure the multiform powers of our globe appear. They are all special forms of solar power—the molds into which his strength is temporarily poured in passing to its source through infinitude."

MISSOURI AS A MANUFACTURING STATE.

WHAT NATURE HAS DONE FOR HER—AND WHAT CAPITAL AND SKILLED LABOR MAY DO.

Forty-six years ago Missouri was the extreme western limit of civilization; all the vast country west of her was the home of the Indian, the buffalo, and other wild animals, and known only to the few hunters and trappers who visited the then unknown region. Then Missouri's vast mineral wealth was little understood, if we except the iron and lead mines in southeast Missouri. She was then in the wilderness, and under the blighting influence of slavery, bodily and mentally. Now, how greatly changed her condition! States and territories are rapidly springing up west of her—her vast and various mineral wealth is becoming known and written of, and inquiries made by enterprising and industrious men from Europe, and from all parts of our country; her vast agricultural resources, mild climate and capacity for raising sheep and all kinds of stock is, through the press, receiving due and deserved attention. Up to this time, little has been done in manufacturing, and less to bring into notice her immense advantages to successfully and cheaply carry on this branch of industry.

The water power capacity of Missouri for manufacturing purposes is little known or understood. The numerous springs in southwest Missouri are equal to a million of horsepower, and are capable of driving sixty large cotton and woolen factories, besides paper and other mills. We particularly describe three of them. Bryce's spring, on the Niangua, is one of the largest; it rises in a secluded valley, where it forms a small pond, and then flows away a river; this river, just below where it flows from the spring, is one hundred and twenty-six feet wide, and has an average depth of about one foot, and its velocity is a little more than one foot per second; the water is soft and well adapted to fulling purposes. This immense spring or creek discharges more than 10,927,872 cubic feet of water per day; the water is nearly pure, sustains about the same temperature at all seasons, and shows no perceptible fluctuations in quantity either in the dryest or wettest seasons. This is one of the many hundred large springs whose pure waters unite and form the numerous streams which flow from this table land. Many of them furnish the very best water power for driving mills and factories. In some respects it is more desirable than

that offered by ordinary streams. The water is so warm during the winter that no ice forms about the wheels or other machinery. The supply of water is constant, and the quantity about the same at all seasons, so that the works are never endangered by freshets, or compelled to remain idle for the want of the usual quantity of water. These advantages have been fully tested, and are duly appreciated, as one would judge from the great number of mills located on these springs. Gunter and Sweet springs also fall into the Niangua, and will furnish sufficient water power for several mills or factories. The streams formed by these springs are numerous, clear and rapid, furnishing sufficient water power to drive all the mills and factories demanded by an ordinary population. While the springs and streams, large enough to furnish good mill sites, are very numerous, the smaller fountains and branches are so abundant that every farm may be supplied. In short, the pure, limpid fountains and streams of this region are unrivaled in beauty and adaptation to the wants of man—they have challenged the admiration and praise of every traveler.

CAPACITY FOR WINE MAKING.

This portion of Missouri has, besides its vast mineral and agricultural wealth, more and better land adapted to the cultivation of the grape than France, Spain and Italy combined. It will yield more than one hundred million gallons of wine, at an annual profit, at the lowest estimate, of fifty million dollars. And what is more important, the pure, nourishing juice of the grape would take the place of the vile, maddening compounds used in the name of whisky, wine and brandy, and drunkenness would give place to sobriety.

The opening up and early completion of the southwest (now Atlantic and Pacific) railroad, under the active and efficient management of General Fremont and his associates, will add ten thousand intelligent families to that portion, making it at once the garden spot of Missouri. Heretofore that part of Missouri has been cruelly wronged by the stubborn imbecility of a former slaveholding class, but will be more than repaid by the class of emigrants that are sure to follow General Fremont; and the future of southwest Missouri will be as bright and glorious as her past has been dark and gloomy. In one word, Missouri has all the elements of a great empire.

NECESSITY FOR MAKING THESE FACTS KNOWN.

Now, it is the duty of the press and our public servants to make this fully known. The million of acres owned by the road when rapidly —as they will be—brought into cultivation, will greatly change the condition of southwest Missouri. Copper and tin are known to exist in Missouri, and in good workable quantities. A smelting and rolling mill for these metals would keep in St. Louis six million of dollars now sent to other places for these most necessary articles. Will

nothing be done to remedy this great drain on our resources? We trust the local press will publish topographical descriptions of the several counties, with such other information as will make that part of the state known, and that it may be represented in a permanent form in the transactions of the state agricultural society.

EXTRACTS FROM THE GEOLOGICAL REPORT.

We give, in a condensed form, from the geological report, a description of the country through which the Southwestern Pacific railroad—now the Atlantic and Pacific—will pass, to impress upon our readers the great advantages which its early completion is sure to bring to that portion of the state, and especially to St. Louis.

"The southwestern railroad from Franklin rises gradually unto the northeastern slope of this table land up to the divide between the waters of the Bourbeuse and the Meramec, until it reaches an elevation of seven hundred and eighty feet above St. Louis, before crossing the valley of the Gasconade. Beyond this valley it rises again to the most elevated part of the line in Webster county; thence through to Greene, Lawrence and Newton, it decends the gentle western slope to the state boundary. This table land, as above stated, has an elevation of some twelve hundred or fifteen hundred feet above the ocean. It has a rolling surface and gentle slopes of some four or five feet to the mile toward the valleys of the several rivers, and no high mountains or arid plains disturb the equitable temperature which usually prevails at that altitude. There are no swamp or overflowed lands from which noxious exhalations can arise, to affect any portion of this country. The climate, as these facts indicate, is most agreeable and salubrious. The summers are long, temperate and dry; the winters short and mild. No climate is better fitted to secure health and a luxuriant growth of the staple products of the temperate zone. The mountain limestone contains numerous and extensive deposits of lead and zinc in Jasper and Newton, and extensive beds of iron in Greene and Lawrence. The time is not far distant when the terraced slopes of southern Missouri will be more valuable for vineyards than the best lands of the state for the other departments of agriculture. It contains the largest part of all the lead, zinc, copper, cobalt and nickel, and a considerable portion of the iron discovered in the state. When it is borne in mind that they occupy an area of some ten thousand square miles in the counties containing railroad lands, we shall be less surprised at the long catalogue of mineral localities in these counties already known, and be better prepared to expect still other discoveries of equal importance. Almost every acre of the alluvial bottoms throughout this entire region has a rich, durable soil, which is well adapted to the culture of corn, wheat, tobacco, oats and the grasses. Some would yield good hemp and flax—articles most essential for manufacturing purposes."

The report from which we copy shows that there are in all two hun-

dred and sixteen lead mines, twenty-five copper and ninety iron on the line of the road. The broad, rich bottoms of all the streams on the line sustain a very heavy growth of the most excellent timber of nearly all the most useful varieties. This timber is indispensable for building purposes in St. Louis. There is probably no part of this continent that can boast of so large a number of bold, limpid springs, whose pure, cold water gush forth in such abundance to beautify and refresh the land.

The lands of this road contain more than a fair portion of the good soils and mineral wealth of this region. The value of her mineral lands is very great, and can hardly be estimated till the road is completed and the mineral raised sent to the market rapidly and at a cheap rate. The good agricultural lands cover a vast extent of fine country, and their value will be greatly increased upon the completion of the road. All the poorer lands will be demanded for timber and pasture, and the day is not far off when those broken ridges and flint hills, which have been heretofore deemed worthless, will command the highest prices for the cultivation of the grape. Some of this mineral land would be cheap at one thousand dollars an acre, and ten dollars an acre would be very low for the million acres yet belonging to this company.

We have thus presented in as brief a space as possible some of the leading features of the country through which the Southwestern Pacific railroad passes. The facts presented will doubtless cause all to appreciate in some good degree the numerous and distinguished natural advantages of this favored portion of our state; but to realize the whole truth, one must see for himself; he must inhale the pure, bracing air beside the bold fountains and limpid streams on the broad, waving prairies, and look on the extensive oak openings; he must descend into the caves and the mine, and behold the glowing furnaces sending forth their streams of iron and lead; he should examine the broad acres, ripe for the golden harvest; in short, he should behold with his own eyes this favored country; and this, we trust, thousands of intelligent and industrious emigrants will do.

THE NECESSITY FOR OUR RAILROAD IRON BEING OF HOME MANUFACTURE.

Every rail, railroad car and engine necessary to carry the road through to the Pacific should be made in Missouri. That part of our manufactory has been greatly neglected.

In castings, steamboat and other machinery, St. Louis can safely compare with any city. In wrought iron she is yet sadly deficient, and the supply is not equal to the demand.

This portion of the state is admirably adapted for the raising of sheep and stock at little cost; its numerous water power for manufacturing purposes; its rich agricultural soil and fine timber; its vast deposits of lead, copper and iron. In addition to this rich source of

wealth, there is in the western part of St. Louis county, and in many parts of Franklin, large beds of the purest silex or white sand for the manufacture of flint glass, an article in constantly increasing demand, and now manufactured elsewhere.

OUR FACILITIES FOR POTTERY, QUEENSWARE AND STONEWARE.

There are in Crawford county large quantities of superior potters' clay, and a small pottery carried on there by three practical workmen, whose limited means prevent them from enlarging their works, and who are, by their united efforts, scarcely able to supply their home market. There is also in the same vicinity clay for the manufacture of white earthen or queensware, and clay in Keolin, Iron county, from which excellent stoneware has been manufactured. Knowing that the country along the line of the Southwest Pacific railroad has been greatly neglected and overlooked (if not worse), our desire is to bring into notice all the available resources of this part of the state, and most especially those designed to furnish the emigrant to that part of the state such information as will insure the active, intelligent and industrious man, whether miner, farmer or manufacturer, a pleasant, comfortable and happy home. When this road is finished all through to the state line, and the many rich mines along its line worked, they will give profitable employment to one hundred thousand men, who, with their families, would furnish a home cash market to the farmer and manufacturer. Towns and villages, with their necessary accompaniments—churches and public schools—will rapidly spring up, so that the mistakes and errors of the past will soon pass away and be forgotten.

We are not without hope that the rapid construction of the Southwest Pacific railroad will not only tranquilize that part of the state, but greatly help to push it forward in a course of prosperity and intelligence.

CAPACITY FOR COTTON RAISING.

That portion of Missouri lying south of 36° 30′, and bounded west by the St. Francois, and east by the Mississippi, was on its first settlement the most delightful, pleasant and healthy country west of the Mississippi, having a rich, luxuriant soil, being removed from the extreme heat of a more southern climate and the long winters of a more northern one. This is evidenced by the name given to their first town, New Madrid. We know that the climate of Spain is the very best in Europe, and Madrid, as its capital, the most healthy. Such, then, was the condition of southeast Missouri up to the great earthquake in 1812, which left that portion of Missouri, and as far up as Cape Girardeau, a dreary waste. Rivers and creeks were thrown out of their beds, forming numerous swamps, destroying large quantities of timber—in a word, making that country as dreary and forbidding as it was formerly beautiful. The general government, with profuse liberality,

gave to the residents there large tracts of lands in other parts of the state to compensate for their losses. We trust that the recently formed historical society of this state will make an effort to collect and publish all the information which can be procured touching that fearful visitation, and show what were its results and the greatly changed condition of that part of Missouri.

THE YET UNKNOWN MINERAL WEALTH OF MISSOURI.

There is one fact which it may be proper to mention here, viz: that during the eruption alluded to, large masses of a superior bituminous coal were thrown up in several of the counties, and some of it lay on the prairies for many years. Yet no workable coal mine has been yet discovered in any part of southeast Missouri. This is another evidence of the yet unknown and undiscovered mineral wealth of Missouri. Under the swamp act there was granted to this part of the state some six hundred thousand acres of land, and to the state at large nearly three millions of acres. This rich grant was, and is, worth fully ten million dollars, and had it been properly used it would have not only brought into cultivation all swamp lands in this state, but also furnished funds to make the Osags navigable for ten months of the year, and the Gasconade, Chariton, Current, White and St. Francois rivers for six months, and thus add fully five hundred miles to our water transportation facilities.

On the swamp land of southeast Missouri, if drained, there would be raised fully one hundred thousand bales of cotton, all of which should be manufactured in Missouri. This rich grant was, however, by Price and his semi-rebel legislature, transferred to the several counties in which the lands lie, and were thus made a fund for the initiated few for the purposes of speculation and peculation, without any benefit to the people of the state. We trust the legislature will fully investigate this gross fraud, and if possible correct it. This is due to the honor and fair fame of the state. We have tried fully to describe that portion of Missouri, south of the Missouri and east of the Osage, for the reason that it has been less understood than northern Missouri; for in the latter the publications of the Hannibal and St. Joe and North Missouri railways, together with the efforts of the local press, have made it fully known, and have shown its adaptation for sheep raising and manufacturing purposes.

The first report of the state agricultural society shows that there is a large factory in St. Charles, ready for capital and skilled labor to commence the manufacture of cloths of all kinds. The same report shows that there is also one in Clark county, on the Des Moines, where cloth suitable to the country is made. We trust the period is not far distant when many factories will be found along the Chariton, Platte and Salt rivers. There, coal is cheap and abundant, and the water is well adapted to fulling purposes. The people in this state, in common

with those occupying the whole valley of the Mississippi, have been much too long dependent on New and Old England for every article of hardware, cotton and woolen goods. This condition of things, with the great natural advantages which we enjoy, should not be permitted to longer continue. There are now in the city of St. Louis two woolen factories, that of Thorp & Co., established some years, and making a good article of domestic cloth, and that of Samuels & Co., recently established, where the proprietors propose to manufacture fine cloth and cassimeres. The latter now employ one hundred and fifty hands, with a demand for more weavers, and expect to use 200,000 pounds of wool annually. There is room for many more cotton and woolen factories to make St. Louis a successful manufacturing city. Rents and the cost of living must be greatly reduced to invite artisans out here; which fact large property owners and capitalists will do well to bear in mind.

OUR SALT SPRINGS.

In addition to its many internal sources of wealth, Missouri has a number of fine salt springs in several parts of the state, especially in Saline county. Capital, energy and skill would make these springs equally profitable as are the New York and Pennsylvania wells, and would give us a home supply of a most useful and indispensable article—salt.

We have endeavored to point out the immense bodies of iron, lead, copper, tin and zinc in Missouri; from the former bar, rails and steel can be and should be made, and that without delay. The vast lead mines of southwest Missouri, if properly worked, would prevent the importation of lead from England.

COPPER AND TIN.

The best copper and tin mines are in Shannon county; there both can be found in quantities to supply the demands of the whole state. Gold, silver and petroleum have been found in several parts of Missouri, and it is believed that a more thorough examination would discover all of them in paying quantities. In our mind the cheapest and best place to manufacture railroad iron would be at Birmingham, in Cape Girardeau county. There, right on the bank of the Mississippi, a company of St. Louis gentlemen had, and perhaps still have, a mining charter and a tract of eighteen hundred acres of good specular iron land, and could have a constant supply of very superior coal from the Big Muddy at a very cheap rate, it being only seven miles distant, and small steamboats could at all times go up there from Birmingham. There is cheap water transportation to all places north and south of these mines, and there would be no difficulty in selling the largest quantity of rails manufactured there, thus saving to Missouri a large and unnecessary outlay.

We have tried to present in this article, in the briefest possible form, the known internal and external resources of Missouri, and its capacity for manufacturing all articles of steel, iron and copper, and cotten and woolen goods. The facts we have presented are the result of long and patient study and personal observation and examination.

We trust the hints we have given may not pass unheeded. We have already said that Missouri possesses all the elements of a great empire, and when her many sources of wealth are brought into active use, Missouri will furnish comfortable and happy homes to 20,000,000 of active, intelligent and industrious people. Lands in Missouri are at this time cheaper than in any western state, and present superior inducements to emigrants from all parts of the world. Such at least is the belief of

EDWARD MILLIGAN.

ST. LOUIS, January 29, 1867.

THE ADVANTAGES AND ADAPTABILITY OF ST. LOUIS AS A MANUFACTURING CITY.

In the schedule of contributions for the coming fair, it is requested that "essays be furnished showing the advantages and adaptability of St. Louis as a manufacturing city for all articles now manufactured in other cities of the Union."

I do not propose to write an essay on that subject, or to compete for the liberal prize offered; but if I can group together a reliable statement of facts which will tend to give any new information that may be considered interesting to your association, I shall be well repaid by the reflection that I may have added something useful to our state, in whose prosperity I feel very great concern.

That St. Louis has advantages and adaptability for manufacturing is abundantly proved by the plain fact that nearly all articles manufactured in other cities of the Union are manufactured in St. Louis, and, in some instances, sufficient to supply the demand not only for the city, but for exportation in large quantities; and if articles are imported it is because the transportation costs less than the difference in labor here and the place where the articles are manufactured, together with the want of capital to combine with labor. For it must be borne in mind that it is only by a combination of labor, with capital that manufacturing can be carried on, except to a limited extent. There may be at hand an abundance of labor, but in the absence of capital the laborer must obtain a loan of it, or wait until he can save sufficient over his daily earnings, after providing for his own support, to have the means of combining his own labor with his capital. To convey this idea clearly, we may as well look to the foundation of all capital, and the true data upon which it is based. It is more exact, perhaps, to say that it is the nearest approximation to which we can

arrive at correct data. In order to keep population at a stand—that is, to keep up the number of inhabitants—the minimum price of labor must be sufficient to support a man and his wife, or their labor combined must be sufficient to obtain what will support them both, and enable them to raise at least two children, besides laying up a support for themselves after they become incapable of laboring. If the laborer can do no more than this, he must continue until the end in this condition—unassisted by capital. If he borrow capital to combine with his labor, he must make his capital and labor produce over what is necessary for support sufficient to pay the interest, else he will fall back to where he started, and be obliged to rely solely on his muscular ability for support. If he can, by his labor, obtain a surplus over a support, he will slowly, but surely, gain capital as time goes on, until he can combine his labor and capital so as to make the capital and labor produce in one day more than his labor alone in two or ten days, and so he would go on until he would no longer, by his own labor, keep all his capital employed. In order to make the accumulated capital go on increasing, he is obliged to employ other laborers. Then it is that he begins to divide the profits on his capital with other persons, and so the workings of labor and capital go on increasing so as to keep up with the demand; and it often happens that in order to employ the capital accumulated, the capitalist uses a part of it in creating a demand where none naturally existed. Now, upon this theory, the laborer who has no capital but his muscular ability to labor, will look for a locality where he will be most likely to obtain for his labor sufficient for his support and acquire capital soonest; and the capitalist who wishes to engage in manufacturing will seek a locality where he can obtain labor to work his capital to the best advantage. Where will he be most likely to find such locality? In the rural districts or in the large cities? We find that the tendency of population in all countries is to locate in the large cities—that is, those populations not engaged in agricultural pursuits, or leading a transient life, as it were —and at the present day the manufacturer who seeks a location will select one, not so much with a view to where the material to manufacture exists, as where the article when manufactured can be distributed at the greatest convenience and lowest cost. The tendency of both the laborer and the capitalist being to locate in the large cities, they will first make the inquiry as to what city possesses the greatest advantages, and is best adapted for obtaining the material to manufacture from, and for distributing the same when manufactured. I will answer the proposed inquiry by stating the fact, that St. Louis is now a large manufacturing city, with a population of over 200,000 inhabitants, and that while there is a large exportation of manufactured articles from St. Louis to other cities of the Union—flour, bacon, portable mills for grain and lumber, sugar mills, cotton gins, mowing machines, pig iron, lead, fire-bricks, stoves, and many other articles I cannot at this moment name—yet St. Louis imports largely from other

cities of the Union articles which are manufactured from raw material originally exported from St. Louis, to be returned again for distribution after it has been manufactured. Iron ore is shipped from Missouri in large quantities to other cities, to be returned again when manufactured into nails, railroad bars, and merchantable bar, sheet and boiler plate; lead and copper are exported and returned in kegs of white and red lead; copper, in sheets and bars; tobacco, hemp, wool, raw hides, flax, fire-clay, and sand, are exported from and returned to St. Louis for distribution when manufactured.

Having established the fact that St. Louis is now a large manufacturing city of all, or nearly all, articles manufactured in other cities of the Union, and having shown that the labor and capital employed is inadequate to supply the demand for articles which are manufactured in other cities that obtain the raw material from St. Louis, this brings the inquiry down to a narrow limit, namely, is the location and advantages of the city of St. Louis such as will give assurance that additional capital and labor can be safely located? and is the location of the city such as will admit of a largely increased population, to be supported for all coming time in a healthy condition? In order that the population of a city may have assurance of the continued healthfulness of the location, the limit to which population may increase without overcrowding must be a consideration of the first importance. To support and maintain the population of a city, the location must be where there is ample space, a sufficient supply of water, drainage and fuel. Everybody knows that the city of St. Louis is located on the west bank of the Mississippi river, below the mouth of the great Missouri and Illinois rivers. The foundation is limestone rock; the space for building is unlimited by any interruption of the ground along the river front, south or north, and the lay of the land to the west is such as to afford excellent drainage into the Mississippi from the high land that divides the waters that flow west into the Missouri, and south into the Meramec from those that flow east into the Mississippi. The river that flows past St. Louis is appropriately called an inland sea; and the mere statement of the fact that the steam tonnage recorded by the surveyor of the port of St. Louis is greater than the steam tonnage of any other city of the Union, is sufficient to give assurance that the supply of water will always be ample.

The people of England are much concerned in view of the increasing population of the city of London. If the ratio of increase up to the present time continues, the Thames will not afford an adequate supply of water in a few years, and the drainage is bad. The city of St. Louis, it may be said, has access by river and railroad to a larger extent of territory covered by forests of timber than any other city in the Union; but for fuel the use of wood will be abandoned, coal being more convenient and obtained at a less cost.

The coal deposit of Missouri and Illinois is a wonderful phenomenon. The area of the coal beds in the state of Illinois is greater in ex-

tent than all the coal fields in England and Wales, and all this is accessible from St. Louis by river and railroad. The vein of coal is found in the bluffs opposite St. Louis, eighteen miles above the city, and it continues as we go south nearly to Cairo, and on the Ohio river above Cairo. The state geologists report the land of Illinois south of St. Louis to be underlaid with coal from the Mississippi to the Ohio river. The practical working of the coal mines in portions of the state appears to bear out the reports of geologists.

The stratum of coal from which St. Louis obtains a large supply is from five to seven feet thick, and although it is accessible at the bluff at the most convenient elevation for dumping on cars, yet it can be reached by sinking shafts along the line of the railroad crossing the state at distances varying from twenty-five to one hundred feet from the surface. No coal veins are more easily worked; there is no mining skill required; any laborer can dig coal in these mine, and from one to two hundred bushels is considered a day's work.

The distance this coal has now to be carried by railroad to St. Louis is from seven to fifteen miles. This is sufficient data for any person to determine the cost of coal delivered in St. Louis from the Illinois mines by railroad. But there is a cheaper mode of transportation: coal is brought by barges from the mines which are nearer the river, above the city, that deliver it on shore or to steamboats. A large supply of coal is obtained from the mines west of the city and adjoining it almost; besides, the coal deposits in the interior of the State of Missouri are of great extent. In Callaway county and bordering on the river there are coal beds which have been opened and worked that show a stratum forty feet in thickness.

These facts, I think, abundantly show that St. Louis possesses all the advantages than can be derived from a locality as to water, drainage, space for building, and fuel; and that these are in sufficient abundance to give assurance that, should the population increase to equal the entire inhabitants of England and France, there need be no apprehension about a sufficient supply of water or fuel.

I will now consider the question of locality disposed of, and consider next the questions which would follow in their order—material for building, and the means for obtaining a supply of provisions for subsisting population.

The materials heretofore and now used for building purposes are stone, lumber, iron, glass, brick, sand and lime. The fact having been already stated that large quantities of iron ore, the material for making glass, flour and bacon are exported from St. Louis, must be taken as conclusive proof that they exist here. But the iron ore and material for making glass I will hereafter notice.

The rock for building many of the houses in that part of the city fronting on the river was quarried from the cellars over which they stand. The same ledge or stratum of rock extends back for miles, but is overlaid with clay everywhere, which makes a superior article of brick

without the mixture of sand. The lime rock lies exposed all along the river front, and makes excellent lime. But a better rock is found at the distance of about forty miles up the river, which can be delivered on barges from the quarry, and is floated down to the city at no other cost for transportation than the time of the men who steer and handle the barges. The rock is pronounced by eminent geologists, for building purposes, superior to any other on this continent except granite, and it can be delivered in St. Louis from the quarries in any shape or size desired. The magnificent Lindell Hotel is built of this rock, but unfortunately not of the best quality that could have been obtained at the quarry. The dwelling house of Mr. Giles F. Filley is built of a better quality of this rock. There is also rock on the Pacific railroad, within the distance of fifteen miles from the city, which is considered by some equal to the quarry on the river. The custom-house and Polytechnic Institute are built of rock from the quarry on the railroad; these buildings speak for themselves, and are the best proofs that can be offered.

The Mississippi river runs over a bed of sand which has been brought down by the floods from the Missouri. This sand is accessible and free to all wherever the shores and bars are exposed; and in low water the bed of the river is exposed for half its usual width. Sand can be obtained of every grade—fine, coarse or sharp, as it may be wanted. Clay for making fire-brick, or crucibles for glass works, is in great abundance from one to seven miles from the city.

The Mississippi river and its tributaries afford transportation from nearly all the lumber regions west of the Ohio to St. Louis; the pine forests of Michigan, Wisconsin, Minnesota, Iowa and Dacotah are all drained into the Mississippi, and float down to St. Louis without any cost for propelling power, and, indeed, at no cost except the wages of a few steersmen to keep it in the channel; and rafts of lumber have come to St. Louis which were started from Lake Superior, coming by Green bay into the Wisconsin river. The pine forest of Florida, the cedar of Tennessee, cypress from Mississippi, poplar and wild cherry from Indiana and along the Mississippi from Cairo to Ste. Genevieve, come to St. Louis by the river. The pineries in southern Missouri are passed through by the Iron Mountain and south branch of the Pacific railroads, and for manufacturing purposes (such as making agricultural implements and building steamboats) the supply comes by the river and railroads.

In regard to lumber for building steamboat hulls, the city of St. Louis has had advantages over all other cities not located on the Mississippi river. The bur, or overcup oak, does not grow on the Ohio river or its tributaries; it is not found east of the American bottom in Illinois, and the superior excellence of this species of oak for the hulls of boats cannot be surpassed. The tree grows to a large size. I have seen logs delivered at the mills in St. Louis, by the river, four and a

half feet in diameter and fifty feet in length, without limbs or knots. The wood is almost as solid as iron when dry; it is so dense that it will not float, and can only be rafted by mixing light wood, such as maple or cottonwood, in the raft. Where this cannot be obtained the raftsmen bore an auger hole in each end of the log, stop the water out with a plug, and the log which had before sunk to the bottom will float. This oak is found in large quantities on the Missouri river and tributaries, and in southern Missouri and Arkansas. The tree derives the name of bur or overcup oak from the acorn, which is very large, and has a cup which projects over the nut, and has a rough, bur-like look.

But for building material, such as is used for steamboat hulls, fences, bridges and houses, we must make up our minds to substitute something else before many years more. The report of the United States commissioner of agriculture states: "It has been estimated that at the present rate of consumption of the lumber districts of this country, the whole region east of the Mississippi will be stripped of everything valuable for this purpose within the next twenty or thirty years." He refers to the consumption for ordinary fuel for towns, factories, railroads and steamboats. The commissioner might have gone further, and stated that in the period of time that the forests east of the Mississippi will be stripped of everything, the pine forests in the north will be stripped on both sides of the Mississippi—that is to say, in a period of twenty-five to thirty years from this time. At the present rate of consumption all the pine forests to the east and south of Lake Superior will be stripped, and that these forest lands now covered with pine, when once stripped, will never produce pine again—the second growth will be of a different kind of timber. It is an aristocracy which nature does not permit, for one kind of timber to monopolize the ground longer than is required for it to mature and die of old age. The commissioner appears to be alarmed at the thought that all the timber east of the Mississippi will be consumed in thirty years, and exclaims, "what shall we do for fencing and farm buildings?" Now I see no cause for alarm. Long before the time arrives that the commissioner names for the timber to give out, a better and cheaper article will be substituted for fencing and farm buildings, and sufficient timber can be saved for agricultural implements, or it can be grown as fast as it may be needed. Stone and iron make better fences and farm buildings than lumber, and will, in a short time, become cheaper for such purposes than lumber now is. The present process of converting sand back into its supposed original granite will enable every one to build of stone, not only the exterior walls, but floors and roof can be made of sand; and the Bessemer process of converting, or rather refining iron, will cheapen the article so as to make a fence of cast steel wire, roofs and floors of sheets of steel, which will cost no more than wood, and will be more durable, certainly. We see it now stated that in France floors are made of concrete, which support themselves without joists or rafters.

Whatever can be done in France in that line can be done here. Whether or not the process of converting sand into good building stone will prove a success, I am not sufficiently informed, at present, to state. If, however, it shall prove so, the sand is here in abundance to make stone resembling gray granite, and some that will appear as white as marble.

But as to the Bessemer process of refining iron, there is now no question of success to be determined. Without going into details in explaining the process, which, by the way, is very simple, I will state certain reliable facts to show that iron, or rather what has heretofore been called cast steel, must, in a short time, become so sheap in this country as to be applied to many purposes for which wood is now used. Here is what the United States consul at Sheffield, England, writes to the secretary of the treasury:

He "was present at Nottingham on the reading of a paper before the British association on the conversion of melted cast iron by the pneumatic process." "Mr. Bessemer stated that, 'before the introduction of his process, the entire production of steel in Great Britain was one thousand tons per week, and now there was machinery for the production of steel on his process alone of five thousand tons in the same period of time. One of the most valuable purposes to which his steel was applied, was the construction of locomotive engines and rails. Where iron had worn out in a few months, steel rails had been in constant use for four years, at the end of which time the first side was still in use.' 'At Camdentown there was a portion of railway over which an immense amount of traffic passes; an iron rail and a Bessemer steel rail were placed opposite each other, and when the iron rail had been changed seventeen times the steel rail was still not worn.' In regard to the prices of steel, Mr. Bessemer said that 'firms that had expended immense sums in the plans and machinery desired at first as large a return as possible for their outlay; but when manufacturers had been remunerated for their first outlay, they would be more reasonable in their demands.' The price of cast steel in Sheffield for the lowest purposes, such as making shovels, Mr. Bessemer said 'was £36 (pounds) to £40 per ton, and the better kinds £50 to £80.' This would be in our money, for the lowest, about $180, and the highest, $400; but Mr. Bessemer stated that 'thousands of tons were being sold at £12 per ton'—about $60 of our money. Mr. Bessemer also stated that 'the iron of the United States which he had seen was peculiarly adapted to the manufacture of steel by his process.'"

The American ores have been sufficiently tested for making Bessemer steel, to prove that it is not only peculiarly adapted, but is of superior quality for that purpose; and of all the ores in America, that from the Iron mountain in Missouri appears to be the best. By the Bessemer or pneumatic process the crude pig metal is at one heat converted into steel which has all the properties of the best quality of cast steel. Indeed, it possesses qualities which makes it superior to

cast steel in this, that while it can be tempered to the hardness which is desired for edge tools and drills, it is malleable and flexible as the softest qualities of iron. It will answer many purposes for which tin is used; and in so far as toughness, strength and flexibility may be desired, it is superior for some purposes to tin plate.

If Mr. Bessemer is the first to discover that iron can be refined and divested of all impurities by his process, he will be justly regarded as a great benefactor to the human race. Men have, in all countries and in all times, exhibited their charity and beneficence in relieving the wants of their fellow men, and, whenever suffering can be alleviated benefactors will appear; but it has remained for Mr. Bessemer to discover how the toilsome and laborious labor of refining iron by the puddling and boiling process can be dispensed with, and a better material produced by a process which is somewhat similar to refining silver. In the time of the prophet Malachias, the people knew how to refine silver. Why was it they did not know how to refine iron by the same or a similar process? If it became necessary in those days that silver should be refined, did man discover the method, or may God have revealed it to him? "And he shall sit refining and cleansing the silver, and he shall refine them as gold and as silver."—Mal. 3d ch.

The Bessemer process of converting pig iron into steel will necessarily revolutionize the iron trade in the United States; when steel equal to the best English cast steel can be made at the cost heretofore of common iron, the present process by puddling and boiling will be totally abandoned. New and different works must be built; and it will be for those who wish to embark in the business to consider what locality possesses the best advantages and adaptability.

The advantages and adaptability of St. Louis as to material for building and location, I have already described. The material for making iron by the Bessemer process is the same as by the present or old method. Iron ore, fuel, lime rock, sand, fire-clay for brick—these are used in making pig iron; and the material for converting the pig iron into steel only needs to have added the material for lining the crucibles.

It is not necessary to describe the Iron mountain and Pilot Knob, in Missouri; every person interested, or likely to become so, in the iron trade, is familiar with these immense deposits of iron ore. This ore can be quarried and delivered upon cars at the Iron mountain and Pilot Knob at a cost depending only on the rate of wages paid to day laborers. One man can quarry out and put upon the cars two to four tons per day. The distance to St. Louis by railroad is about eighty miles to the Iron mountain, and eighty-six to Pilot Knob; but there are other deposits of ore much nearer to St. Louis on that road, and also large quantities on the south branch of the Pacific road.

The richness and fusibility of these ores has been ascertained by the working of three furnaces at the Iron mountain for the past twenty years, and two at Pilot Knob for about eighteen years. These.

are charcoal furnaces, and their yield of metal per day has been uniformly thirty per cent. greater than has ever been produced by charcoal furnaces in this country or Europe, and with less fuel per ton than others use. This has abundantly proved the superiority of the Missouri ore as to yield of metal by furnaces, and the quality of the iron for all needful purposes is nowhere surpassed. A large amount of the steam tonnage on the Ohio river is engaged in carrying Missouri ore to Pittsburg and other cities on the Ohio, a portion of which goes to the Cambria iron works, ninety miles east of Pittsburg, to be mixed with the poorer ore of that place, and returned to Missouri in railroad bars. It needs no other argument to prove the advantages of St. Louis for making railroad iron. The two freights—the ore to the Cambria iron works, and the rails back—is a large item.

Much has been said by those who are engaged in other states in manufacturing iron, against the quality of the mineral coal (the locality of which I have described) for melting ore at St. Louis. The only question there can be on that subject is as to the quality of the coal for melting the ore into pig metal. The rolling mills and puddling furnaces at St. Louis have been successfully using the Illinois and Missouri coal for converting pig metal into all descriptions of merchantable bar, boiler plate, sheet iron and rails for the past sixteen years; and this narrows the coal question down to this, namely—can furnaces be built that will make pig metal by using Illinois and Missouri stone coal as fuel? The experiment has never been fairly tried. The furnaces at the Iron mountain and Pilot Knob use charcoal; they are charcoal furnaces. The proprietors of these furnaces had a quantity of Illinois coal (not of the best quality, however,) and coke from the St. Louis gas works taken to the furnaces some years ago; they made about the same yield of metal with the raw coal and coke as with the charcoal. This metal was much mixed with sulphur, and made bad iron when worked by itself; but by mixing it with better metal it would answer for railroad bars. The proprietors were not engaged in making rails, and the furnaces being for charcoal, there was no inducement to proceed further, inasmuch as they had a market for their charcoal iron.

About three years ago a furnace was built at Carondelet for the purpose of making pig iron with the stone coal from the Gravois mines, back of the town. The gentlemen who furnished the capital are largely engaged in other business; they are not experienced manufacturers of iron, and felt but little interest in it personally beyond the interest of the state; they left the matter pretty much to the man who superintended the work of erecting and starting the furnace. The gentleman who put up the furnace admonished the proprietors when he was putting up the blowing machinery that it would, in his judgment, prove insufficient. When the furnace started this was found to be true, and before alterations could be made the superintendent died. Nothing more was done; the furnace never started

again; and it has been said by parties who, perhaps, do not know any better, that the attempt to make pig metal with Missouri and Illinois coal has proved to be a failure. Such a statement is not correct. This furnace, it is true, stopped, but it was not a failure. The blowing apparatus was too weak. The furnace did make iron with inferior Missouri coal for several days, and it mattered not as to the quality; time would have regulated that. When the stone coal furnace at Massilon, in Ohio, first started, the pig iron would not sell for half the cost of making it: now foundrymen send their orders to the Massilon furnace for such quality of iron as they may want, and the same are filled; and thus has the failure at Massilon to make good iron at first not only proved a success in making good iron, but they can turn out all the qualities of iron that are desired. The iron made at the Carondelet furnace was as good as the iron first made at Massilon.

There never has been any question as to the material being on hand at St. Louis for making iron. The only question has been the quality of the coal—that the sulphur in the coal rendered it impracticable to make pig iron of a quality that can be refined into railroad bars by the ordinary process of puddling or boiling.

No proper test has ever been made by the erection of a furnace, with suitable appointments and machinery, with a view to expelling the sulphur in the process of making pig metal. By the pneumatic or Bessemer process of refining the melted pig iron into steel, all impurities are expelled by intense heat, which burns up or expels every other substance except the iron, which is purified like silver. The toilsome, laborious process of puddling and boiling is dispensed with, and the operator who refines iron by the pneumatic or Bessemer process sits like a refiner of silver: "for he is like a refining fire; and he shall sit refining and cleansing the silver; and he shall refine them as gold and as silver." The refiner of silver sits watching the refining fire until all impurities are expelled, and when he can see his own image reflected in the metal in all its purity the process is complete. The refiner of iron by the pneumatic or Bessemer process sits watching the refining fire until he sees that all other substances have been expelled, and at that moment the process is complete.

Having, as I think, said enough about location, and the advantages at St. Louis for manufacturing iron, I must beg leave to advance some suggestions in regard to the uses that Bessemer iron can be applied to where common iron will not answer so well, on account of the cost and its weight. The Bessemer process of producing steel equal to the best cast steel is about the same as the cost of making the ordinary qualities of iron; the per centum of loss in converting from the pig iron into steel is about the same as in refining the pig into bars by puddling or boiling.

The labor of refining by puddling and boiling is the hardest that man has ever been required to perform. Hence it is that so few apprentice themselves to that trade, and hence it always has been that

there was a scarcity of puddlers and boilers sufficient to justify the erection of works to supply the demand for iron for all the purposes to which it may be applied. For example: all the rail mills in the United States, if kept constantly running, are inadequate to supply sufficient iron to keep up the repairs on all the railroads; and to increase the number of rail mills sufficient to supply iron for the roads to be built, keep up repairs, and keep the mills constantly running, would require more puddlers and boilers than could be found in the country; and hence it has been that the railroad companies of this country have been obliged to seek a locality in other countries where labor and capital are combined, to obtain iron for building railroads over our own beds of iron ore and coal. All this is now to be changed. By the pneumatic process, the metal is refined into steel by the application of simple labor—the services of the puddler and boiler are dispensed with. All that is necessary in the laborer to render him competent to refine by the Bessemer process is ordinary muscular ability; whether or not he has ever served an apprenticeship to any branch of science or trade is of no concern; and the operation not being laborious, labor will readily be obtained sufficient to produce all the iron wanted, whatever the quantity may be. As to the uses to which iron may be applied, Mr. Bessemer has shown that steel rails last seventeen times as long as iron rails. Now, if we take the average wear of iron rails in this country at seven years, the steel rail will last one hundred and nineteen years; but suppose it will last ten times as long as iron, seventy years. The new roads built of his steel rails will not require repairs for say fifty to seventy years; this would, after all the roads are relaid with steel rails, require but few works to keep up the repairs. The cost of steel being about the same as that of common iron per ton, the strength of one ton of steel is equal to at least two tons of iron; that is to say, the tensile strength of the Bessemer steel is, so far as experiments have been made, more than one hundred per cent. greater than the best quality of iron. The objection to the uses of iron for many purposes is its great weight; by substituting steel, half the weight will give the strength of iron. We see reaping and mowing machines made of iron substituted for wood, and not much heavier than those made of wood. If made of steel, the weight is reduced one-half, and, of course, the cost of the steel being the same as the price of iron, is also reduced one-half. For agricultural implements, for farm buildings and fences, the steel will cost one-half the present price of iron. But we must look for a very great reduction from the present price of iron in this country; it will keep up for a time in order that those who invest their capital in the erection of new works must get a return of the same. When that has passed, and the means for supplying the demand become ample, the price will be a fair remuneration on the cost of manufacturing and interest on the capital; and the facilities being so great for all persons who desire to embark in that branch of manufacture, the probabilities are in favor

of the article being reduced in price so as to afford but a small margin to the manufacturer.

GLASS.

I have already stated that lead, sand and fine clay is shipped from St. Louis to other cities in the Union to be used in the manufacture of glass. I will merely add that Professor Silliman delivered a course of lectures in this city a few years ago, one of which was upon the facilities at St. Louis for manufacturing. The learned professor spoke of the advantages geologically. He stated that he had as a geologist examined all the countries where glass it manufactured, and that he nowhere found the material of better quality or in greater abundance for manufacturing all descriptions of glass than in the immediate vicinity of St. Louis.

LEATHER.

The value of raw hides exported from St. Louis to be manufactured into leather in other localities, annually, is estimated at about three millions of dollars, and the value of tanned leather annually distributed at St. Louis is estimated at from nine to ten millions of dollars. Tanbark and raw hides never exist in the same locality to any great extent where the manufacturing of tanning leather is carried on by using bark; the raw hides must be carried to the tanbark, or the bark to the hides; and it is for the manufacturer to consider, before he invests his capital, which alternative he will adopt—the facilities for transportation either way is the same.

PROVISIONS NECESSARY TO SUPPORT AN INCREASED POPULATION.

I have already stated the fact that large quantities of manufactured flour and bacon are exported from St. Louis. I omitted to add that wheat, corn, oats and pickled beef is also exported in large quantities. Cattle, hogs and sheep constitute a large bulk of the steamboat freight south from St. Louis.

In order to keep the inhabitants of a large city in a healthy condition, an abundant supply of the kind of food necessary must be furnished. This must be of a mixed kind, adapted to the seasons. There must be a supply of the garden vegetables, as well as the bread and meat. Our exports of the latter are sufficient to show that we have a surplus; and the splendid exhibitions of all kinds of fruits and garden vegetables at the agricltural and horticultural fairs is the best proof that can be offered as to abundance and superior excellence. When we consider that almost every acre of land in the states of Missouri and Illinois can be made a garden spot, there can be no apprehension about fruit and vegetables.

The flour manufactured in St. Louis brings a higher price in Boston and New York than any that is made elsewhere. The fact that flour is

shipped in large quantities from St. Louis to Boston, is conclusive evidence that the price obtained covers transportation and leaves a remunerating profit to the state.

Having considered all the material questions of location, water, fuel and the material for building and manufacturing, as well as the provisions to support an increased population, I will next describe the means and advantages for collecting at St. Louis the material to be used in manufacturing and distributing the same when manufactured.

St. Louis has her iron arms stretched out in all directions; but she has, in addition, a cheaper and surer means of transportation—the Mississippi and Missouri rivers are self-supporting thoroughfares, free to all.

The cost of transportation by steamboats on the Mississippi river is from two to three mills per ton per mile. This pays the interest on the capital invested in steamboats and the cost of handling freight; but when freight is transported in barges or on rafts there is no capital invested, and transportation costs merely the labor of steering and handling—the rivers keep up their own repairs. Now as to the extent of navigation on those rivers and tributaries, our geographies give all needful information; nevertheless, I may give some facts as to the practicability of this extensive navigation. I have already stated that the Mississippi drains all the lumber regions of the north to Lake Superior and Lake Huron. The pine forests of Florida, the cypress of Alabama and Mississippi, the cedar of Tennessee, the poplar and wild cherry from Indiana, and all the other species of lumber, is to be found within the states bordering nearest to St. Louis. The distance navigable by steamboats on the Mississippi from St. Louis, north to the Falls of St. Anthony, thence on the Dacotah, may be considered thirteen hundred miles, and south from St. Louis to New Orleans, twelve hundred miles. The tributaries on the north by the Mississippi river reach Green Bay, and by the Illinois, Lake Michigan. Steamers go loaded from St. Louis with freight to be delivered at the head of navigation on the rivers which run through the states of Arkansas, Louisiana, Tennessee, Mississippi and Alabama; and to the east, to Pittsburg, Pennsylvania; while the great Missouri affords transporation by steamers of a large class northwest to Fort Benton, a distance of three thousand miles, to the Great Falls, and above those falls the river is again navigable for a long distance. And I may here mention, as a fact of my own knowledge, that there have been thifty-five and forty steamers engaged this season in the trade between St. Louis and Fort Benton on the Missouri river, and that a large number of these went as high as Fort Benton, some of which made two trips to the Fort from St. Louis since navigation opened in the spring. These boats all went up loaded to their depth, and while the down freight was not much in bulk, yet the amount of gold dust which came by steamers to St. Louis is estimated at about sixteen millions of dollars.

Upon a careful consideration of the facts I have stated, persons

who are not already familiar with those facts can form a pretty correct idea of the advantages and adaptability of St. Louis as a manufacturing city of all articles manufactured in other cities of the Union.

In regard to the manufacture of articles, no one can foresee what articles now manufactured may go out of use, or what new ones may be invented. Iron, glass and leather must always remain permanent. If we undertake to speculate about what may happen in the future in regard to manufacturing, we look back to what has heretofore been done. Twenty-five years ago there were no reaping nor mowing machines—large capital and a numerous population were then engaged in manufacturing mowing scythes and grain cradles. Twenty-five years ago there was large capital and population engaged in manufacturing stage coaches and harness for transporting the mails; now the telegraph and railroad put all that out of use. Immense capital has been invested in ocean steamers employed in carrying the mails from America to Europe; now one man at each end of the telegraph does that work. A few days ago a man in London paid a hundred guineas to have a spark sent by the wires from Nova Scotia to light his cigar; the spark was sent, the man lit his cigar by it, and appeared well pleased. The act was looked upon as a silly display, but that one hundred guineas was worth thousands to the world of science.

Some weeks ago, a correspondent of the Scientific American, writing from Oil creek, Pennsylvania, states: "But a short time since the rural farms of this region were lined with wagons and teams hauling barrels of oil from the wells to the railroad—the profane shouts of the teamsters filled the air. Now all this is changed. Mr. Haley has laid iron pipes from the wells to the depot. The oil is raised by the engine six hundred feet below the surface, flows through iron pipes into a tank on the railroad car, and delivered in Jersey City, four hundred miles from the wells, without ever being touched by the hand of man. Iron pipes are also being laid to the Alleghany river, where the oil will flow into barges and towed to St. Louis if necessary. The manufacture of barrels and consumption of hoop iron is dispensed with; the horses, mules and men employed find some other employment." The grain elevator, bulkhead boat and grain wagon have done away with grain sacks to a large extent. One girl will now accomplish with the use of a sewing or knitting machine the work which formerly required fifteen. So of washing machines and numerous other modern inventions.

God has provided everything for the wants of man, and has placed everything where it will be wanted, or where it can be obtained. "God created man with physical and intellectual faculties adapted to labor: He has given us a mind adapted to investigate the laws of the universe, and a body adapted to perform all those operations by which, in obedience to those laws, the objects of desire may be produced. Labor is necessary to the healthful condition of our powers

both physical and intellectual. Without intellectual labor the mind becomes enfeebled. The universal law of our existence is, 'In the sweat of thy face shalt thou eat thy bread.' And, on the other hand, God has assigned rich and abundant rewards. 'The hand of the diligent maketh rich.' 'Seest thou a man diligent, he shall stand before kings.' The pleasures, the independence and the power arising from knowledge are the rewards of intellectual industry. It is by industry the riches of the earth are appropriated and the laws of nature made available to the happiness of man. All that now exists of capital, of convenience, of comfort and of intelligence is the work of industry, and is the reward which God has bestowed upon us for obedience to the law of our being."

When God led the Jewish people from the fertile lands of Egypt, He told them, "I will bring thee into a good land of brooks and of water and of fountains, in the plains of which and the hills deep rivers break out"—"a land of wheat and barley, and vineyards where fig-trees grow"—"where, without any want, thou shalt eat thy bread and enjoy abundance of all things"—"where the stones are iron, and out of its hills are dug mines of brass."—Duet. 8th ch.

When the invisible hand of God led Columbus across the (then) trackless ocean to this continent—when his crew murmured as did the people led by Moses—he could, if it had been revealed to him, have told them of greater treasures than were to be found in the promised land—a land of wheat and barley, a land of brooks and of waters, where there are mountains of iron, and out of its hills are dug not only mines of brass, but of lead, of copper, of silver and gold.

The question may be asked by persons not acquainted with the facts as to the location, adaptability and advantages of St. Louis for manufacturing—what are the motives and design of the St. Louis agricultural and mechanical association for indorsing this argument? Can it be that they are prompted by selfishness, in the expectation that the introduction of additional capital and labor will add to their own advantage? Or may it be that they desire others to come here to better their condition? What are the social and political conditions of society in the city and state?

It may not be inappropriate here to state the facts, or some facts, which will enable those at a distance to approximate to a clear idea of our condition in that regard. The census of the city shows the population to be 204,327; of these 85,951 came from the different countries of Europe—from Ireland, Germany, France, Spain, Italy, Russia, etc. This shows that persons from all parts of the world may here find a society congenial to their particular nationalities. The churches, the colleges, universities, public schools, medical colleges—the Polytechnic Institute, where it is proposed to give gratuitous instruction on all scientific subjects—these splendid institutions and the magnificent buildings are, in proportion to the population, equal to [illegible] in the Union. A description of all this is to be found in our geog-

Upon

raphies. Whenever it becomes important for the interests of society to make an exhibition of our progress in civilization and patriotism, St. Louis has always been equal to the occasion. This has been illustrated on different occasions so as to be the wonder and admiration of those who have traveled in all countries. The splendor and magnificence with which the President of the United States was received and entertained on his recent visit to St. Louis has never been surpassed. What other city in the Union (or indeed elsewhere) could turn out thirty-six such steamers as accompanied the president and party from Alton to Carondelet, then rounding back to St. Louis, each one carrying a flag with thirty-six stars and E pluribus Unum?

A few years ago the future sovereign of England made a visit to St. Louis, and while here went to the agricultural and mechanical fair then being held; and while it may be that the Prince of Wales, a mere boy, had his mind directed to the display of fine horses and cattle, there was with him Lord Lyons, the Duke of Newcastle, and others of England's ablest statesmen and philosophers, who looked at our social and political condition as an index of an independent people capable of governing and supporting ourselves in everything needful for a refined civilization. When they looked at 20,000 people at our fair grounds, possessing all the comforts and luxuries of life, and deporting themselves orderly without the presence of an armed police, and looked upon our river with the splendid floating palaces passing to and fro, the splendid warehouses, hotels, churches, colleges and schools, and were told that less than a century ago the savage roamed undisturbed over these prairies, and no civilized man had an abiding place where the city of St. Louis now stands, they were overwhelmed with wonder and amazement. That was a proud day for the people of St. Louis and for this republic. Those statesmen and philosophers were able to see and comprehend that, whatever contingencies may happen, the American people have the means within themselves of being always equal to the occasion; and by the exigencies which happen, we have so fully developed all our native resources and our genius and talents. It was owing to the exigencies which happened that has given us a uniform national currency.

Having glanced over, as it were, our location, resources, and social condition, it may not be improper to say something about our political condition as one of the states of the Union. The people of the State of Missouri have the foundation for their state legislation as the other states, namely, the constitution of the United States, and can make whatever laws they deem necessary and proper, provided such laws do not conflict with the constitution of the United States; and the power to correct errors or mistakes in state legislation, and to change or dismiss their officers if unfaithful or not trustworthy, is also vested in the people of the state. These are facts that every person is presumed to know; nevertheless the people of the State of Missouri, as well as other states, have times of commotion and disorder growing

out of supposed or real errors and mistakes in legislation; but so sure as commotion and disorder come from errors and mistakes in legislation, so surely will the people (who have the power) correct those errors and mistakes, and in time restore order. I am much opposed to troubling myself or others in speculations or propositions about what may or may not happen. It appears to me always safest to deal with existing, practical realities; but to take a national view (which must be permitted), the State of Missouri is peculiarly and favorably situated for becoming one of the most powerful states of the Union. The area of agricultural soil is in proportion to her other resources for supporting a larger population than any other state in the south or west, and as she increases in population, she will proportionally increase in political and material power.

And now, that the route to India has been determined, the commerce between the east and the west will pass through the State of Missouri; and like the majestic steamboat that starts from St. Louis, outstrips the current of the mighty Mississippi, carrying the commerce of the north south to the sea, returns loaded with the products of the south, triumphing over the current, dashing her proud foam upon the shores and sandbars, so will the iron horse of commerce start westward from St. Louis, outstripping the buffalo and antelope, dash his foam on the prairies and snowdrifts of the Rocky mountains, connecting by steamer on the Pacific, speed his way into the capitals of the Tartaric races inhabiting China and Japan; and, like the war steeds of the Greeks and Romans, that returned from victory dragging the triumphal car loaded with trophies and tributes, the fruits of prowess and skill, so will the iron horse return from the Indies dragging the triumphal car of commerce and modern civitization, loaded with products and fruits of the Indies received in exchange for the implements which christian civilization has produced. And when the traveler from China approaches the west bank of the Mississippi, he may see the bronzed statute of Col. Benton standing on a pedestal, with one arm stretched out toward the west (so emblamatic of the original), and inquire for what purpose was it erected? He will be told, for the first time, perhaps, that it was with a view to immortalize the spirit which actuated that far-seeing philosopher and statesman, who stood upon the same ground nearly half a century ago, and with one hand stretched toward the west, and with all the powers of his eloquence, pointed out the route to the Indies.

JOHN MAGWIRE.

ST. LOUIS, September 29, 1866.

APPENDIX.

Since the preceding pages were written, September, 1866, to the present time, February 2, 1867, there have been sufficient quantities of iron manufactured in the United States by the Bessemer process to

determine its quality, and, so far as tests have been made, it appears that the Missouri ore from the Iron mountain is peculiarly well adapted. The per centum of loss in weight by converting from the Missouri pig metal into refined Bessemer iron, or, as some term it, steel, has proved to be less than any other metal which has been tried. Large quantities of Missouri pig iron have been sent for by the manufacturers of Bessemer iron, to be shipped from St. Louis to Troy, New York; and boiler plate iron, manufactured by the Bessemer process at the Troy works, sent back to St. Louis to be made into steamboat boilers.

Messrs. Chouteau, Harrison & Vallé, of St. Louis, had a quantity of their Iron mountain pig iron refined by the Bessemer process at Wyandotte, Michigan. The ingots were brought back and rolled at St. Louis into the various sizes and forms of merchantable iron. The navy and war departments sent for samples of this iron, and the chief officers of both bureaus sent back reports of the test they had made.

These reports show the iron to be greatly superior in strength to the best known quality of charcoal iron—twice the strength of the best charcoal iron. The chief officer in charge of the engineer department at Washington has reported to the manufacturers of Bessmer iron, at Troy, New York, that the iron has been put to all conceivable tests, and that he was astonished at its great strength and flanging properties. He ordered forty tons of boiler plate iron, and stated that hereafter he should universally use it for boiler plates for all government vessels.

The Mining and Scientific American Journal states as follows: "When rolled or hammered this iron (Bessemer) is completely homogeneous. The rough ingots sometimes have bubbles in them; but since the walls of these bubbles are entirely clear of oxide or slag, they weld together under the rolls or hammer so thoroughly, that when the bar is broken not the slightest trace of them can be found."

And since writing the essay in September last, I find the coal deposits along the Mississippi, in Illinois, have been more fully explored than heretofore. Persons of practical experience in making pig iron with mineral coal have examined the coal beds at Big Muddy, and back of the town of Chester, which is about seventy-two miles below St. Louis, and they are so well satisfied that the coal will work well in blast furnaces for making pig iron without coking, that they have secured a large amount of coal lands in that locality. Twelve miles from the Mississippi, and immediately east of Chester, by the recent exploration there were found three strata of coal—the first, thirty-one feet below the surface, and from six to seven feet thick; the second, seventy-seven feet below the surface, and four to four and a half feet thick; the third, one hundred and nineteen feet below the surface, and six feet thick. The great difficulty in making pig iron with bituminous coal in the blast furnace is that it has to be made into coke in order to clear it of the bitumen which makes it choke or bridge in

the furnace; by coking a large per centum of the heating quality is lost. Coal that has strength, and is durable, if free from bitumen, will work well in the blast furnace without coking; such coal has been found in northern Ohio and part of western Pennsylvania, where furnaces have been using it for twenty years successfully without coking. But the coal at Chester, Illinois, it is decided by persons who have been engaged in the business of making pig iron in the Mahoning valley with raw coal from the Briar hill mines, that the Illinois coal at Chester is a better coal than that used in northern Ohio and western Pennsylvania. I may here add that for many years I superintended the making of pig iron and refining the same into blooms, on the Juniata, in Pennsylvania, with charcoal, and in my judgment the coal from the Chester mines will work well for making pig iron with Missouri ore in a blast furnace without coking; it comes nearer to charcoal than any mineral coal I have ever seen.

The coal in England and Wales lies so deep below the surface that it has to be hoisted up through a perpendicular shaft. In Pennsylvania, Virginia, and on the Ohio river, the coal lies under high hills, and is reached by tunnelling from the ravines and water courses back under the hills. In Illinois the surface is a level prairie, and the coal bed can be reached from any convenient or desirable point. The car that starts on the rail track from the river continues by an inclined plane to the bottom of the mine, is filled there, and returns back to the river. From the data here given, to wit, the thickness of the coal strata and distance from the river, any one can estimate the cost of coal from the Chester mines delivered at St. Louis. J. M.

ON INDIAN CORN.

BY J. L. MATTHEWS, OF JEFFERSON COUNTY, MISSOURI.

Every country has its bread crop, which far outranks every other in importance. In England we find the wheat crop holding this place; in Ireland the potato. In France and in most of Europe wheat stands pre-eminent in agricultural importance. In China rice holds the same position, and in nearly every country on the globe there is some one crop which very much more than any other affects its prosperity, or in fact its very existence.

In the United States we may have a failure of rye, barley, oats, rice and even potateos and wheat, and it would put us to serious inconvenience. The price of all these articles would advance very much, but if at the same time we have a good crop of Indian corn, the inconvenience would be the most we would suffer.

On the other hand, should we have a total failure of the corn crop, it would bring us nearer to a famine than any other possible circumstance, in a country having so much diversity of soil and climate as our favored land.

A failure of the corn crop would put up directly the price of beef, pork, lard, butter, cheese, mutton, as all these are made directly from it, and indirectly it would advance the price of all other bread stuffs beyond the means of the poorer classes. Happily a total failure is almost an impossibility, and even a very short crop does not happen often. There is no other grain that will stand the same vicissitudes of wet or dry weather, and yet make a fair crop. It will grow on any soil, and no other grain is so completely under the control of the cultivator.

In the latitude of Missouri, and in most of our Missouri soils, corn can be raised in its highest perfection.

The position of Missouri in regard to the great water courses of the continent, having the Mississippi along one side over four hundred miles, and the Missouri running through her entire breadth, and along a large part of her western border, together with their innumerable tributaries, gives her a great advantage both as to the vast area of the rich soil which is always found contiguous to water courses, as well as the equable distribution of rains affected by the proximity to large streams.

In regard to the proper cultivation of corn there are many opinions as to the details, but there are two rules on which we believe every intelligent cultivator agrees, and on these two rules "hang all the law and the prophets" (profits, too.) The first of these is to break the soil deep and mellow, and the second "is like unto it." It consists in keeping it mellow. Yet, although everybody is agreed on these rules, the neglect of them is the most common cause of failure. There are two ways of planting followed, one in straight rows both ways, and the other in rows only one way. On large farms the latter plan is seldom followed, as it necessitates the use of the hand hoe, which is entirely unnecessary in a well cultivated corn field. By planting one way only the largest yield can be had to the acre without doubt, but by laying off in perfectly straight rows both ways, the most corn can be raised to the hand, and, as acres are cheaper than hands here, this is generally considered the best plan.

The most common way of cultivation is to break up the ground in April or May, with any ordinary two-horse plow, four or five inches deep, laying off in rows each way about four feet apart; the laying off is done with a one-horse plow, planting six to eight grains to the hill; thinning to two stalks after the corn is safe from frost and cutworms. It is usually plowed as soon as the stalks show across the field, say when from three to five inches high, throwing the dirt from them with a one-horse plow. In about ten days it is plowed again, either throwing the dirt to it with a moldboard, or running a

shovel plow close to it and breaking up the center, making three trips across each row. After this, it is plowed once or twice more at intervals of about ten days, according to the judgment or engagement of the cultivator. At the last plowing the dirt is usually thrown as high against the stalks as possible, in order to cover any grass or weeds. This is the most general plan followed, and under this system it has proved very remunerative. The soils being rich and new, manuring has not been necessitated, and even without any rotation the culture has been profitable. The writer has seen fields which have been cultivated in corn for forty years, and still yielding paying crops; and there are many places in the state where the soil is practically inexhaustible, the subsoil yielding good crops after the surface soil is washed off. Yet while admitting this, we would not recommend a continuance of this system of cropping, as these inexhaustible soils, which do not necessitate manuring or rotation, are the very ones on which it will pay most. The greatest reason why our farmers are unwilling to pursue a more judicious system of cultivation is that they have made money under the old plan. They are content to "let well enough alone." But if in other states lands which had ceased to yield anything over the cost of cultivation have been made to yield large profits (and they have), certainly our lands while yet new will yield a greater increase. A system of fancy farming which costs more than it yields, is by no means to be advocated, but there are some improvements which are in reach of every one if they were only convinced they would pay. There are some crops which high manuring on a rich soil would ruin; the stalk would not be in proportion to the grain, but such is not the case with corn, which may be manured very high with barn-yard or stable manure on very rich, natural soil, and always to advantage. The average crop of the state is under forty bushels to the acre, while we have a well authenticated case of two hundred bushels to the acre having been raised on ten acres. This shows what it is possible to do under favorable circumstances. In order to manure the land we must first save the manure, and to do this requires shelter to feed under in winter, so that it will be dropped in one place, and not scattered around in the fence corners to increase the crop of weeds. It can be spread any time during the winter and without waiting for it to rot, as it will rot on the ground, and all the gasses will be absorbed by the soil and not wasted as they are from the manure heap; the seeds which are scattered with it being unimportant on corn land, as the thorough working it should get destroys them as fast as they sprout. Fall plowing is also very important; the frosts reducing the soil to a condition it is impossible to attain by any other means. It also destroys large numbers of worms by exposing the grubs to the frosts.

If not plowed in the fall, it should be plowed twice in the spring, and not less than eight inches deep.

If the soil is very loose and falls to pieces well, one plowing will

answer if well done, or on sod land, one plowing and then well harrowed with a Shares harrow before laying off. Laying off is best performed with a short, wide sled, having three runners made of four by four scantling, five feet long, having tracks the width of the rows, one runner always returning in the last furrow. The runners being only four inches high, the floor of the sled levels all irregularities in the surface, and causes the furrows to show very plain. This is very important, as success depends a great deal on the grains being accurately planted, so that it can be worked rapidly by horse power.

This sled can be drawn with ease by two horses, and the driver standing on it. Some lay off with a marker made by a simple pole fastened across the end of a tongue, and having teeth driven through at the width of the rows.

On very loose soil this does not mark plain enough to plant with rapidity and accuracy. Whatever plan is adopted for marking, the object should be to have it done perfectly true and so that it can be seen very plainly. Too much care cannot be given to this part of the operation, as if done carelessly the crop cannot be worked so quickly or so neatly. We once heard a slovenly farmer demonstrate, mathematically, that he could plant more corn in a crooked row than a straight one; but the sheriff afterward sold his farm. With a sulky cultivator one man can do the work of two while the crop is young.

The opinion of many of our old farmers to the contrary notwithstanding, we think it best to work very shallow after the first working. If the first working is done with a plow, it may be deep; afterward, if the surface is kept loose, it is all that is necessary, and much better than breaking the roots by deep working.

It is very important to give a thorough working after the crop has reached the hight of four and a half to five feet. If it is cleaned, then the corn has so completely the start that weeds and grass will not do any harm afterward. If at the last working the grass or weeds are getting started close to the plants, it will be necessary to finish up with a plow which throws the soil high and thus cover them over.

A great deal of labor is annually thrown away by planting too early. In the latitude of St. Louis, the 15th of April is about the earliest time for planting, and then only in case the ground is warm. Warm and sunny weather is much the best—"the sunshine should be covered up with the seed." From the 1st to the 10th of May is usually the best time for planting; although any time before the first of June is not too late, and in some seasons even a few days later will succeed.

The most common plan throughout the state has been to plant from six to ten grains in a hill, and afterward thin out to two. Since the advance in labor, many persons have adopted the plan of planting three or four grains in a hill, and risk getting a good stand from that.

Thinning is the most laborious work in the cornfield, and the only work which must be done by hand.

On very strong soil three or four stalks to the hill do better than two. If the soil is not of the best character, two stalks is the most that should be left.

We very much need accurate statistics of the yield per acre from the various kinds of seed in use. To get such information, it is necessary to measure exactly the ground and the product, and the varieties experimented with should be planted as near as possible under the same circumstances, and the results reported to the county agricultural societies.

Planted on clover-sod well broken, corn is more certain to make a good crop than any other rotation. The great danger to be guarded against is the cutworm, and to do this it must be planted late. On thin soils the rotation should be regulated as always to follow clover with corn.

We presume that individual interest will always be sufficient stimulus to most men to put forth their best efforts to increase the product of their lands; but in the west we have a higher incentive added to that. It is but a short time since our surplus corn crop saved the lives of thousands of starving Irishmen.

The bread crops of Great Britain are annually decreasing in proportion to their population, and they are fast learning to eat our corn. The population of our cities and of our non-grain-raising states south is rapidly increasing. The wheat crop is from several causes becoming more and more uncertain. The day is not far distant when a failure of the corn crop of the west would be severely felt over the whole civilized world. The increase of a single bushel to the average yield per acre of the state would be a great help toward paying our taxes.

TOBACCO.

BY E. M. HUBBARD.

Man in all countries, ages and climes has demanded stimulants, either alcholic or narcotic, and very few there are who do not crave it in some form, inveighing, perhaps, against it in some other form, in good, round terms.

Narcotics comprise tea, coffee, opium, etc., but prominent above all narcotics is tobacco, the culture of which important (as it has particularly lately become) branch of agriculture, I propose to treat of. Its discovery is, doubtless, familiar to all who may chance to read this, but I cannot refrain from expressing what a blessing it would have been to travelers, promenaders, concert and even church goers, had the nasty weed remained in obscurity, however much employment it

may give to makers and venders of spit boxes. I will leave the matter of the unhealthfulness, indecency, etc., to be discussed by professors of hygiene and moralists, but who, if they condemn it, must be prepared with plenty of moral courage among a nation of spitters. But if we must have it, let us by all means have a good article.

The particulars of how to raise it, after considering the above, I approach with timidity from seeming inconsistency. However, God certainly causes the plant to grow, as he does the tea shrub and coffee trees, all narcotics together. It is very profitable to the attentive and industrious farmer, and to the country at large it is of very material benefit, by swelling the amount of exports; and it may not be out of place here to express a doubt as to the propriety of killing the goose that lays such fine golden eggs (by saving that much coin from exportation), by putting on an equivalent to an export tariff, as has been advocated by some in congress—by taxing the leaf and allowing no drawback when exported. Such a course would shut up in this country all that is raised in it.

There are many other tobacco producing countries besides ours, but we have the advantage, and can just as well supply the world with tobacco as with cotton; but in neither case let us kill the goose, but rather give it extra care.

In the raising of tobacco, no lazy, never-do-to-day-what-can-be-put-off-till-to-morrow sort of a man need attempt it. In short, there is no crop that demands such unremitting attention as it does—none that will indicate so palpably any neglect from beginning to end, and herein consists one-half of the secret of tobacco raising.

There are two different kinds raised in the United States, viz: Connecticut seed leaf, which is used for cigars, and is raised principally in Connecticut, Massachusetts, New York and Ohio. The other variety is mostly for chewing, and is raised principally in Virginia, North Carolina, Kentucky, Tennessee and Missouri. The culture of the two kinds is identical in many respects, but it is of the raising of Virginia tobacco that this article will treat. There are many varieties of this kind, differing in fineness, size of leaf, brittleness while maturing, etc., etc., going under the names of Big Daniel Jones, Little Daniel Jones, Big Frederick, Little Frederick, Orinoco, Big Yellow Prior, Little Yellow Prior, Green Prior, Blue Prior, etc., etc.

With me the Yellow Prior, either big or little, has the preference; combining more excellent qualities for this section than any other sort, though it requires longer time to mature than any other kind.

Almost any kind will, however, adapt itself to the soil and climate where grown, and will acclimate itself in two or three years if brought from any foreign country, which is the reason that the qualities produced in Cuba cannot be produced in this country, though fresh seed from Cuba be sown every year.

Care should be used to get pure seed of whatever kind is to be raised, and also not to let different kinds of seed plants go to seed

within three hundred yards of each other, as different kinds mix very readily.

Tobacco delights in warm, rich, loose soil, peculiar to the ridges of Virginia, Kentucky and Missouri.

A growth of white and black oak, walnut, hickory, dogwood and hazel thickets indicates the right quality of soil for fine tobacco, if properly cultivated.

Prairie lands will raise nothing but coarse, strong, low priced article. The idea that slave labor was essential to the producing of it was absurd, as negroes are proverbially careless, and care is so necessary, especially at cutting time.

The crop is objected to by many as being an exhausting one, and the worn out fields of Virginia are pointed to for corroboration; but if tobacco be the cause, why do we not find similar results in Connecticut, where it is raised so extensively?

With all due deference to my Virginia friends, I must say that the style of farming in that state would impoverish any soil, no matter what be the crop; so don't let us curse tobacco, except for the sins that really belong to it.

Is tobacco exhaustive to the soil? So is any crop, and I had rather have it raised on lands of mine than Hungarian grass. The old Virginia style of farming, that is, saving no manure, would ruin any farm, no matter what was raised on it.

I had rather have tobacco raised on my fresh cleared land, for a first crop, than any other. The land, by the process of cultivation, becomes better subdued than by any other crop.

In reference to the encouragement of the culture of it, agricultural societies give it the cold shoulder. I have yet to see the first premium offered for it, or even for any essay upon it, except that offered (thirty dollars) by the American Agriculturist, in 1863. The St. Louis agricultural and mechanical association gave the best patch of sweet potatoes a handsome premium, but for the best crop of tobacco, the first, perhaps, of the list of Missouri's agricultural productions, not one cent was offered!

The good farmer will raise but one, or at the outside two, crops of it from the same field after clearing. A good hand can tend three acres well in ordinary seasons, provided there is no other crop to interfere. Fresh woodland is decidedly the best, and should be cleared after the crops are gathered, and during the winter, and should be plowed with a jumping colter, just as soon as it is dry enough in the spring—the earlier the better.

Between the first of January and the first of April the seed should be sown at a time when the ground is neither very wet nor frozen. I prefer February.

I prefer burning a bed on fresh ground to a rich garden spot, as in the latter the weeds will constantly require attention, while a burnt place on new ground will require but little weeding.

I select a dry, warm hazel knoll, on creek or branch bottom ground, inclining to the southeast, if I can find such; not inclining too much, however, in any direction, as spring rains will in that case wash the seed off.

I clear off, where I am going to make a bed, about twenty feet square, get off all leaves and everything, then I pile on it plenty of brush, just as close as possible, to insure a good burn. Then on top of the brush I pile poles, saplings and logs, as large as I can get on, and set it on fire, and am careful to see that all the bed is well burned over.

As soon as it has all burnt, and while warm, I commence digging it up with a grub hoe or mattock, picking up all roots, etc.; in short, make it as mellow and smooth as possible. After it has become cold I sow seed as even as possible, which I do by mixing it with a quart or so of fine ashes.

Different planters have different notions about the quantity of seed to sow. On a bed twenty feet square, I think two good sized table spoonfuls, if evenly sown, is not too much. A bed of this size will afford plants enough for setting out four or five acres. After the seed is sown, I smooth it as hard as can be done with the back of a spade or shovel; some tramp it all over hard. It, of course, requires to be fenced from stock. If weeds come in the bed they must be pulled out. If it gets very dry it must be watered, but if watering is commenced it must be kept up until a rain comes.

Some, at the time of sowing, put small brush over the beds with the butts to the northwest, taking it off after danger from frost has passed. It keeps the beds warmer and catches frost that would otherwise fall on the plants, and, perhaps, kill them. Cleanings of the hen house, put on the bed, will forward the plants.

I might as well mention here, everything should be ready for housing the crop before even the plant beds are made, otherwise it is more than probable that cutting time will come without being ready.

The proper size for barns is twenty feet square inside, and should not be larger; for any advantage gained in room will be more than lost by want of uniformity in the color of the tobacco. A twenty foot barn can be filled in one day by six experienced hands. The leaves will begin to yellow uniformly, and, of course, all in the barn will need fire at the same time, which will not be the case even if only two or three days' time are used in filling the barn.

The barn may be either log or frame, and should be twenty-two feet high to the eaves, which will afford five firing tiers, which I make three feet apart above each other; the highest long tier being immediately under the plate, and four feet wide between the tier poles, each four feet being a "room." These tier poles should be straight and stiff, and at least a foot through at the butt. I prefer sycamore, being stiff and having a smooth bark. Rough bark will bruise all the

tobacco that comes in contact with it. There are also roof tiers. A barn of this kind will hold two acres of medium sized tobacco, and by crowding will contain three; but it is poor, very poor economy to be stingy with room. It should have plenty of space in the barn while curing; the more it has the better it will in all probability be; and I will add that, if stables, etc., are relied on to hold the tobacco when cut, better give up raising. It wouldn't pay. The barns must be made as tight as possible up to fourteen feet high; above that should have some ventilation. Tobacco sticks must also be made before cutting time, for then every minute will be too precious for such work. I rive them of either hickory or oak. They should be made about one inch thick by one inch and a quarter wide, and four feet long. The larger the tree they are made of the better, as they will not spring so much made of large timber as made of small. As I rive them I smooth them with a drawing knife, and sharpen one end to fit the socket of the spear, which is made in the shape of a V, and which receives the stalk of the tobacco, which passes over it on to the stick. It will require seven to eight hundred sticks for a twenty foot barn.

Now, for the cultivation of the crop. I have the ground well worked and the roots picked off before the middle of May; then I throw two furrows together, with a one-horse plow, to make a ridge, the tops of which should be three and one-fourth feet apart; and, on very rich land, the ridge rows should be three and one-half feet apart.

The first rain that comes, after the plants are as large as cabbage plants are when they are ready to set out, should be taken advantage of. The plants should be set in those ridges about three feet apart. I make a hole with a peg, a little larger than my finger, put the root of the plant pretty well down in this hole carefully, and press the dirt to the root carefully and well. If the dirt on top becomes dry, I brush it off with my foot, until I come to moist earth, before I set out the plant. If the ridge is very loose where I am about to put a plant, I stamp on it first. Setting out must be done with all possible celerity; but care must be taken not to slight the work. Moist earth must be pressed firmly around the roots. It is astonishing how fast any one familiar with the work will set out. I have put in plants at the rate of 12,000 per day, for six consecutive hours; but it is severe on the back.

I never replant either corn or tobacco; they rarely mature to do much good; the shade of the older plants, if nothing else, prevents. In about two weeks after setting out I "scrape down"—i. e., hoe it, without hilling, and pick off any bud worms that may have commenced their aggravating work.

They are very diminutive and destructive, as they usually eat out the bud of the plant, rendering it, of course, nearly worthless.

In three weeks or so from the first hoeing, I plow between the rows with a shovel plow, and hill up well, first taking off two to four bottom leaves, which is called "priming." In six to eight weeks, according to

the season, from setting out, it will be ready to top. I prune again, same as before topping, taking off all leaves that indicate that they will not grow to much size, and just as soon as I can count twelve leaves (no matter how small the top ones may be) on two-thirds of the plants, I commence "topping"—i. e., I pick out the bud, or top—leaving on twelve leaves—taking great care not to tear the delicate top leaves that I leave on. If topping is deferred until it is nearly ready to bloom, the leaves will be small and narrow. I continue topping as they grow, until all are done. I save four or five of the best plants for seed. The bolls nearest the top are the best; and I break off the shoots that will be backward.

The bolls of the seed plants must be watched while green, to keep off the bud worms. The crop, from topping until it ripens, must receive undivided attention, to keep off the worms and suckers. The suckers must not be allowed to grow to over four inches long. I endeavor to worm and sucker over the field every fine day.

It must be allowed to stand until it becomes ripe—thoroughly ripe. It sometimes "sunburns" in spots—a sort of a "rust." I can't say that I know the cause; but it is no indication of ripeness.

When the plant is ripe, the leaf will crack in two when doubled at noon with a warm sun—though the experienced cultivator can tell a ripe plant the moment he touches it, with his eyes shut.

Three fields out of every four are cut too soon, and very few there are who cut too ripe, which is a material cause of there being so much poor tobacco.

If there is any part of the work you may be dilatory about, it is the cutting—though the weather must be watched, and not let a rain come on it after it is ripe. It will be seen that care and watchfulness are necessary, and good judgment must be exercised; and no exact method can be followed, as the seasons vary so much. It will also be seen that no "slouch" is fit to raise it. When I am ready to cut, I have the suckers and worms taken off very thoroughly. It is important to have it done, as suckers will grow, and worms will eat, long after it has been housed.

In cutting, I commence in the afternoon about three o'clock, or as soon as danger of sunburning has passed, and cut enough if possible to fill a barn before six o'clock. I cut with a hatchet, and lay the plant down very carefully, on a place free from roots, or anything that will tear it. (I will here remark that the ground should be as free as possible from snags, etc., at planting time.)

The next morning after cutting, and after the dew has dried off, I commence hauling to the barn on wagons with frames twelve feet long, with boards, of course on the bottom. It must be handled very carefully, it will bruise so easily; otherwise better not have raised it. Three acres carefully handled at cutting time has many and many a time brought more money than other crops of four times the size badly handled. I avoid handling the plant except by the butt. Before

loading I "bunch" the tobacco in rows, and drive between the bunch rows and put in small loads with the butts out, putting it on in layers, commencing forward and finishing the load in light as I load. Then it can be unloaded just as it was loaded, one hand standing on the wagon, (but not on the tobacco!) and handing it off just as it was put on. As I unload I pile it by two inch auger holes bored in logs, stumps, or posts, into which holes I put the unsharpened end of the tobacco stick.

I bore these holes two feet or so from the ground, and incline it up, as the stick will naturally sag.

On the sharpened end of the stick I put the spear, and with a quick jerk pull the stock over it about six inches from the butt end, never handling the leaves except to part them, to prevent being torn by the spear. The plant must be put on the sticks at regular distances, and eight to ten plants on a stick, according to their size. Plants must not be pulled out from under other plants; better not have planted it than do it; it bruises so easy.

I have tried all the styles of cutting, hauling, spearing and hanging very effectually, and the above is my preference, very decidedly. I prefer cutting in the afternoon (keeping a sharp eye to the weather), for it will then come in cool. It bruises much less when cool than when warm. I prefer spearing in my manner at the barn to putting one end of the stick on the ground, for the ends of the leaves will become entangled by the latter way, even with the most careful hand.

If spearing is done in the field there is more liability to sunburn, and it will receive rougher treatment than by spearing at the barn, even at the hands of the experienced. Celerity is very necessary at cutting time, but care in handling must be continually uppermost in the mind.

In hanging in the barn, I, of course, hang the five tiers and the roof tiers in a room at once, which will require three hands upon the tier poles besides those who hand the sticks up. I hang on the bottom tier, then on the next above, then the next, and so on; then commence on the bottom tier again, hanging the sticks eight to nine inches apart. The end sticks must not stick over into the next empty tier alongside; if they do, they are likely to tear in hanging in the next room. In cutting them every precaution must be taken to avoid bruising or tearing. I have seen crops that would have brought, by good treatment, $2,500, rendered almost worthless by nothing else but rough treatment and bad management at cutting time. The old-fashioned way of cutting by slitting the stalk is nearly obsolete. I tried it one year, but saw nothing to recommend it.

The cutting is tedious, requires more hands to fill a barn in the same time, requires more care in hanging in the barn, and I am satisfied the leaf is not so heavy as when speared. Scaffolding in the field has been superseded by hauling directly to the barn. If tobacco

is hung too close in the barn, it is liable to "house burn," losing its life and virtue—rendering it almst valueless. If there is danger of its house burning, small fires must be made under the tobacco at once, but I will not give much advice on the subject, as no discreet planter will crowd his crop in the barn. I again repeat, don't be stingy with barn room; it is very poor economy.

It may be crowded after it is cured while "in order." I have put three barns full into one to make room for more. After the tobacco has hung in the barn a day or two it will begin to yellow, and when the leaf is about half yellow I commence firing; sometimes sooner, sometimes later, according to the weather, the amount of sap in the plant, etc.

I have a small trench in the barn on each of the four sides, as near to the side of the barn as I can safely.

I have no trench through the middle—none is needed. When I commence curing I make very small fires all round, and gradually increase them as fast as I can without "coddling" the leaves, i. e., scalding or cooking it, which turns it black and renders it nearly worthless.

It will coddle quickly if put in a pile quite warm at cutting time. An ignorant, careless man, in curing, might ruin a barn of tobacco in fifteen minutes by putting on large fires.

When the leaves are about half cured, which will take thirty-six to forty-eight hours, I fire just as hard as I can and keep safe. Smoke should be avoided as much as possible, and to that end I fire with the largest logs I can get into the fires. Green hickory is good, as it lasts well, the heat is regular, and the smoke is less bitter than oak. Smoke makes it bitter and affects its value quite seriously. Judgment must be used in firing; the fires must be heavier on the side toward the wind, and heavier all over the barn in cold, damp weather, than if dry and warm. After the fires are started they must not be allowed to go down, day or night, until the leaf and stem is well cured. It is not the heat that cures, it is the dry air that results from the fires; though of course a warm dry air will cure much faster than cool dry air. Anything that will dry will cure. Heat will do no good unless it is at the same time drying, which leads me to conclude that furnaces, big stoves, and such like, will not do to fire with. The heat is not a drying one, and it is illustrated by drying a coat by the stove or before a fire-place. The latter will do it in a quarter of the time. But the question arises how are we to avoid the smoke? I can only give it as my opinion that curing by charcoal is the only way. It is expensive, but query: will not the tobacco be worth more than the difference in the expense of firing? and it is certainly much safer.

The bitterness caused by smoke will gradually leave by repeated bulking and hanging, but labor is too high to afford to do it. I must not omit to inform the new beginner, if he has a good barn of tobacco cured red, but carefully and well handled in cutting, and cut ripe, not

too soon after a rain, he has what will bring a handsome price. If it can be cured yellow or even piebald it is of course worth that much more, but I want to impress upon all who read this for information, the value of careful handling, at cutting and housing time. The best firing possible cannot make a choice article out of a crop bruised and mangled in harvesting. If a rainy, damp spell comes on within two weeks after I have quit firing, I make fires again to keep the leaf from "running." After that I take advantage of all damp weather to strip.

Sometimes I make four or five sets, but usually three, viz: bright, seconds and lugs.

Those unacquainted with wrapping a hand of tobacco, can find some one in the neighborhood to show them; it is very simple. The most experienced should do the assorting in stripping.

I pick out the choice leaves and put them by themselves (to be re-assorted before tying up); make another pile of the worm-eaten and poorest, for the lugs; the rest are the seconds. The leaves in each hand, and the hands in each hogshead, should be as uniform as possible. The smallest leaves should be used to tie with; a large tie leaf makes a hand look slovenly, no matter how neatly it may otherwise have been done.

I put ten or thirty of lug leaves in each hand—eight of seconds, and six of choice. Nice management in tying may make twenty per cent. in the result of a crop.

At the end of each day's stripping, I string it across tobacco sticks and hang it up again, putting each assortment in a separate room. The safe way for the new beginner is to let it hang there until he is ready to "prize" for market, which, under ordinary circumstances, should not be before April or May.

It should not go into July without being in a bulk. When it is desired to prize, it must all be bulked down the first hot spell, and just as soon as it can be handled without shattering the leaf.

It should not be "prized," if the stem is in order. Such will not keep.

I will not explain how to put it in a hogshead. That will be much better learned from some one that knows, or at a city tobacco warehouse.

Of common lugs, I usually put fifteen hundred pounds in a hogshead; of seconds, one thousand; of bright, what will pack in with the weight of the prize lever. It is better to sort out the bright, even if there is not over a hundred pounds, and put it in a box.

I believe I have given the material points necessary to be understood by the inexperienced, and have been as minute as I thought requisite, without being too prolix. Much must be learned by experience and observation, no matter how particularly the directions may be given.

The first crop will be, very likely, a discouraging one, and, perhaps, unprofitable. I have had considerable experience in cultivating it, and still I learn something by observation or otherwise every year.

I omitted to mention the amount an acre will produce, which will vary from eight hundred to twelve hundred pounds, according to the soil, season and cultivation.

SHEEP HUSBANDRY.

That the writer of the following pages lays no claim to a scientific dissertation, will be apparent to any one who may chance to peruse the following; the object being to sketch, somewhat in detail, the practical operation of sheep husbandry, designed merely to aid the neophyte in the business.

A good location, the first requisite. This should never be flat land; the higher and rougher the better, so there is plenty of herbage, as sheep will do well where horned stock would suffer. Equal parts salt, sulphur and hardwood ashes, spread upon tar, should at all times be accessible. If smearing the nose two or three times in the course of ten days fails to cure cough, that sheep should be taken from the flock. During the gad-fly season mellowing a small piece of ground twice a week with the plow will afford them great relief, as a good cloud of dust is their best defense. That the best results are obtained from a given capital, I think I hazard nothing in saying the Spanish or French merino breeds should be used.

Commencing with the newly sheared flock, one of the first operations is to dip old and young in tobacco water of sufficient strength to kill the ticks. This should never be omitted, as it not only kills the vermin but promotes the growth of wool. Another, and the next necessary annual process, is paring the feet. This is most easily done following a heavy rain, usually supplied in June. Have sufficient help engaged to complete the job in half a day. The best implements, common pocket knives. Place sheep on point of rump, feet from you, with head under left arm, and you are in good position for operation; pare off smoothly all projections of hoof, which often extend from toe to heel, being careful not to penetrate the quick.

If from the breath, or walking where infected sheep have passed, or from any cause, that dreaded disease, "foot rot," should break out, lose no time in paring away as much of the diseased hoof as practicable; if necessary, leave only one side of hoof on one claw to walk on. Then with a piece of soft pine shaved thin at end, dipped in butter of antimony, containing as much corrosive sublimate as will dissolve, plunge it down between hoof and foot, as far as matter is indicated. Clean the spatula in old cotton batting each time before dipping in solution, being careful to use from a small portion at a time. This will effect

a cure in nine cases out of ten on the first application; but it is well to put the affected ones together for two or three weeks, as the old saying, "one sickly sheep infects the flock," holds good here. In ten days, if any limp, apply as before. From this till time of weaning lambs no extra care is necessary. If they can run on a fallow, while making diligent search for everything green, their little hoofs are pulverizing the soil most beautifully, and if one spot needs enriching more than another by plowing it, for reasons before named, they will attend to that.

Lambs should be taken from their dams first of September. This gives ample time for the system to become self-supporting before cold weather. An old and gentle one with bell should be put with them, that they may become familiar with the keeper. Best place a cornfield, as tickle grass and such like is much better than grass pasture, and it also prevents the land from becoming stocked with weed seeds. Wean much easier out of hearing of old flock for at least three weeks. The ewes should be looked after every two or three days, and their udders relieved two or three times. After going dry their fare should improve their condition previous to coupling time, to insure the best success in the next crop of lambs. For one hundred and fifty ewes a buck, worth not less than one hundred dollars, should be used. Should be in high condition at coupling time, which should not commence sooner than the 15th November—many prefer first December. Five months being the period of gestation, one can choose his own time for the lambs to drop. By letting the buck serve each ewe but once, they are frequently used for two hundred with good success.

As feed gets short, grain should be supplied, being careful to commence with a small quantity, say half a gill per head, a gill being the maximum; always bearing in mind that grain, properly fed, is returned two-fold over in meat and also in the increased quantity of wool. As winter advances, unless they have good range with but little snow, they do best confined to the yards. The main yard should have a tight fence on all sides but south, with shed on the north. Subdivisions are readily made by placing feeding cribs north and south, giving a portion of shed to each. Cribs are quickly made of inch pine lumber, one foot by twelve, nailed on a two by two scantling four feet in length, used as posts, one in each corner; one piece on lower end of posts on each side, eight inches from that nail others as high as desired; connect two ends with pieces about three feet long, same way, and stay in the center, and you have a cheap crib, at which twenty-four head can comfortably feed.

In cold weather, if undisturbed, from nine forenoon to two in the afternoon is their feeding time, and they should be watered in warmest part of the day. Lambs, ewes and wethers should each be kept separate, and, as far as possible, always have dry feet. Where many are kept, a hospital will be necessary. If flat rocks, old planks, or flat timbers and the like are elevated about one foot above the surface at

suitable distances around the yards, if not more than a foot in width, they are usually occupied as lodging places, especially in moist weather —showing their aversion to wet feet.

Before allowing them to range in spring, clip the wool square and close to the end of the tail, as this prevents the commencement of filth, and saves a deal of labor and considerable wool. If salt is withheld on turning to grass till they are sheared, there will be much trouble avoided from scouring. In yeaning time close attention pays a heavy per centage. The young lamb is often unable to draw the milk, owing to a hard substance in end of the teats, and frequently the first discharges adhere to the tail or thighs, completely closing the draught. The younger, when castrated, the easier for them; never docking and marking until well, as castration is all they should bear at one time. If one disowns her lamb, by tying in stable, and having a dog near until, by milking and feeding, it passes, giving her the scent, all will be right. (Until several weeks old all ewes take the scent before letting their lambs suck.)

About the first of June is washing time, and in eight or ten days commence shearing. It is not strictly necessary to have running water; any pool that in washing does not cause muddy water; the stiller the better. Never catch sheep by the wool, as it causes the blood to settle, and, it is said, causes hairs to take the place of wool in the succeeding growth. Always first place the shepherd's crook just above the gambrel on the hind leg, and nearly all that have been used to the hook will back up to you, when, with your right hand, you grasp the off hind leg, and with your left the near fore leg, and as you lift, roll their feet up with the back toward you, and you have the easiest position for yourself and sheep. One of the most important items in sheep husbandry is to get good shearers, and when found they are cheap at high wages, while poor ones are dear for their board. By placing the ends of the fingers on the edge of the outer blade and the ball of thumb on the other, the shears can be placed flatly on the sheep, giving the wool a gentle pressure with the left hand, so as to not give the wool a second cut nor yet raise the skin. By taking short clips shearing is both handsomely and economically done.

Immediately after shearing being the time to sell fat wethers, they will bring twenty per cent. more nicely sheared than otherwise. At three years wethers are much the easiest fattened. Good or poor, tying the fleece will vary the price in market from one to five cents on the pound. The wool buyer makes his bid on the "best side out principle," and, unless you act accordingly, he gains what you lose, and both are ignorant of the fact. The fleece should be carefully laid on the tying table inside down, and placed as closely as may be in a natural position, then fold sides so as to leave it double, then lap the ends so that one more doubling will bring the shoulders for the outside or wrapper, then tie at suitable distance from the edge and cut off; the same on the other side and cut off; then across same way,

cutting off each tying. If properly done, will appear in quite a square form. Should be packed or corded in tight room, as compact as possible, leaving it weighted down. If left in this condition thirty days the increase in weight will be nearly ten per cent.

In conclusion, I would say, from seven hundred dollars invested, by following the foregoing through a series of seven years, I realized four thousand three hundred dollars, saying nothing of increased productiveness of farm. A. C.

LONG WOOLS AND MUTTON SHEEP.

[From the Farmer's Advertiser.]

Within a few years past quite a change has taken place in the relative prices of fine and coarse wools, particularly in that of long combing wools. Until within two or three years preceding the war, fine wools, merino, Saxony, and their grades, were worth from twenty to as high as seventy per cent. more than coarse wools—even long, luster wools. For ten or twelve years preceding the war, when fine wool—"full blood" merino—brought from thirty-five to forty-eight cents per pound, in different years, coarse wool—which term at that time covered not only native, but also what little combing wools were then raised—had a range of only from eighteen to twenty-five cents per pound. The war enlarged very much the demand, and consequently the price, of even our coarsest, hairiest wools. In almost all army goods it was one of the requisites that a yard of cloth should be so heavy. With coarse wools a greater amount of stock can be got into a yard.

As wool growers for many years had been growing fine wools, the supply of coarse was relatively smaller than for twenty years before the war. The consequence was that even coarsest of native outsold the finest of Saxony by a number of cents per pound.

In addition to the war demand for any coarse wools there has also sprung up within a few years past a demand for combing wools, and and which also now outsell the finest Saxony by from five to ten cents per pound. These wools are coarse wools, as distinguished from merino wools, etc., but must not be confounded with native and such like coarse wools.

By the term combing wools is understood Leicester, Cotswold, and other long stapled wools, possessing a sort of luster different from the appearance of our common, coarse native wool. We have a new branch of manufactures in the country made exclusively of these wools, and, as the supply of them is small, enhancing the price. Before the reciprocity treaty with Canada was abrogated, American manufacturers using such wools bought them comparatively low; but at present, having still to get the largest part of their supply from there, they are com-

pelled, on account of the small supply and consequent competition with each other, and the fact that Canada is now a foreign country, to pay about ten cents per pound more for them than full blood sells for.

The same causes which make combing wool sell highest of any wool in our market, are likely to continue a number of years In addition to the smallness of the supply of it in the country, there are strong influences and interests at work which will have a tendency to retard the spread and increase of growing combing wools. Among the most powerful of those influences may be mentioned the high-price-fancy-merino-sheep-mania of the day. The most influential and experienced wool growers of the country are all interested more or less strongly in fine wool growing and its spread through the country generally. Many of them, in addition to their strong belief that the merinos are the more profitable stock to keep, have invested considerable money in full blood sheep, from which to breed some for sale for stock purposes. It is not to be expected that such men, who have handled fine sheep for many years, and who believe in them, will change very soon for another breed, requiring very different handling in many respects.

It is then left principally for those engaging in sheep husbandry de novo to keep mutton sheep and grow combing wool. The most of those breeds bearing combing wool are mutton sheep also; the South Down, however, although one of the best of mutton breeds, cannot be said to bear combing wool. In England South Down wool is designated as middle wool, and in some old writers as fine wool—but this term is used there in distinction from Leicester, Lincoln, Cotswold, Bakewell and other long wooled sheep of England. It is generally known that no fine wooled sheep—as we understand by the term—are kept in England, viz: Merino, Saxony, etc.

Cotswold and Leicester sheep—which are par excellence breeds bearing combing wool—will, under proper conditions of keep, etc., shear from seven to nine and ten pounds of wool per head, taking flocks through. The chief requisite is that too many shall not be kept together.

So much preliminary. For application, I would say to those contemplating the keeping of a few sheep, if you are so situated that you can have a choice, take the Cotswold sheep.

I premise that a man, unless under very unusual circumstances, shall not keep to exceed one hundred and fifty sheep.

Under the supposition, which I think is a true one, that combing wools will bring more than fine wools for the next ten years, it is plain to be seen that the man keeping but a small flock, or the man with whom sheep are not a specialty, will have an advantage in keeping Cotswold sheep. I have specified wherein I think combing wools will bring more than fine wools: first, the much less supply; second, the fact that quite extensive manufactories have sprung up within a very few years, using combing wools exclusively.

Moreover, on account of the merino mania, of which I have spoken,

one can obtain full blood Cotswold sheep at much lower figures than full blood American (Hammond or Atwood) merinos.

To men desirous of keeping but a few sheep, to obtain wool for domestic purposes, with perhaps a little to sell, no breed of sheep presents greater advantages than the Cotswold. But, mind you, they must have room and feed. You must not suppose that they can make you the profitable returns if you treat them as you do your common, coarse, native sheep. They are not of a rambling habit; they must have big grass, and that, too, on a small patch of ground. In a general way, you must give them nearly as good a chance as you would two or three year old steers.

Thousands of farmers in Missouri and Illinois, who do not now keep a sheep ought to—to eat up what they now waste; and, with the most of such (men growing other products), the Cotswold is the breed to keep.

I have not a Cotswold sheep to sell, and, moreover, never owned one, nor ever expect to. I am a merino man, but, from twenty years' experience, I am satisfied that many men would be pleased with a larger breed of sheep than the one I keep. It is for my interest, and that of all fine-wooled sheep men, that all farmers should keep a few sheep of some breed. Once let the farmers of the west, as a class, own sheep, more or less in numbers, and that soon will it be seen good by the legislators of the country to foster that interest.

If the farmers of the west wish to be hewers of wood and drawers of water, let them put and market the products of their industry into the simplest forms; let them grow and sell bulky grain; let them dig and send abroad their raw materials.

Why do farmers engage so strongly in dairying or fruit raising? Is it not to escape the tax on dear freight transportation?

Let us western farmers let eastern farmers grow and market raw wheat and corn, and oats and barley. And why not? Are they not much nearer the seaboard? Does it not cost them much less to send those bulky articles to market? We of the west ought to drive them out of the raising of wool—as we have, in a measure, out of the raising of pork and beef—and so, too, ought we out of the making of cheese, the growing of hops, and numberless other products whose transportation bears but a small per cent. of their value.

Farmers of the west! what products cost you least to send to market? Bear in mind that New York city (except in the case of vegetables and some fruits near to a city market) is the market for the agricultural products of the entire west.

Please bear in mind two things: first, what products our soil, climate, etc., are most favorable to the production of, and secondly, what per. cent. in value of our products are necessary to carry them to market. With wool at forty-five cents per pound, how many cents will carry it to market? With wine at two dollars per gallon, what part of a gallon will it cost to carry it to the consumer? So with cheese; so with hops; so with tobacco.

I once bought a bill of stone at Joliet, Ills. (one hundred and forty miles from home), for $4 80, delivered on board the cars; the freight on it was $25. Comment is unnecessary.

Moral: Grow some things that railroads, or express companies, or warehouses, or commission houses, or elevators won't eat up.

S. P. B.

SHEEP RAISING IN LAWRENCE COUNTY.

On the first of December, 1862, Cyrus Poage, living six miles northeast of Mt. Vernon, purchased of his neighbors, in small lots, forty-five ewes and forty-one wethers, for one hundred dollars. They were mostly of the common stock of the country, a few only being one-quarter blood merino (French).

In 1865 a buck of one-quarter blood merino was added to the flock

FIRST YEAR.	DR.		CR.
Eighty-six head cost	$100 00	Wool sheared, 258 lbs. at 86c	$221 86
Keeping at 50c	43 00	Thirty-four lambs at $1 50	51 00
SECOND YEAR.			
Keeping 120 head at 50c	60 00	Wool, 360 lbs. at 66c	237 60
		Thirty-two lambs at $1 50	48 00
		Two best butchered at $5	10 00
THIRD YEAR.			
Keeping 150 head at 50c	75 00	Wool, 450 lbs. at 60c	270 00
		Thirty lambs at $1 50	45 00
		Two best butchered at $5	10 00
Keeping 178 head at 50c	89 00	Sold 78 before shearing at $3	234 00
		Wool, 300 lbs. at 60c	180 00
Shearing 456 head at 5c per head	22 80	Thirty lambs at $1 50	45 00
		Four butchered at $5	20 00
Total Dr	$389 80	Total Cr	$1,372 48
			389 80
		Leaving a balance	$982 68

The herding on the prairie in summer was done by a small boy, costing about nothing.

This gives a net profit of $245 87 per year, and a flock of 126 sheep and lambs worth $345.

The loss from wolves is an average of five a year, of which no account is kept—the pelt just about paying for their keeping.

He considers the sheep the most profitable stock that is raised.

This flock has yielded him more clear profit than twelve mares worth from $200 to $1,500, and costing much more feed than the sheep.

He turns his sheep on the prairie the first of May, and herds till first of August, when they are turned on the meadow, where no herd-

ing is needed except to turn at night into a lot, with sheds of prairie hay for shelter, where two cur dogs and a Newfoundland dog keep off the wolves and stray dogs.

They feed mostly on the prairie in summer, and on the meadow in the fall and winter. And in severe weather in winter they are fed shock-corn (corn and fodder together).

He has lately purchased 252 head of sheep of a finer grade of Spanish merino, and intends increasing the business.

Yours, respectfully,

J. W. BLACK.

MR. VERNON, Lawrence county, Mo.

BOARD OF AGRICULTURE.

All of the western states have a state board of agriculture, to which the legislatures have committed the trust of improving the condition and developing the agricultural interests of the state. Not quite two years ago the Missouri state board of agriculture was organized, and is now zealously endeavoring to perform the task imposed on it. One volume of the annual report has already been published and distributed, and the second volume is now ready for the press. These annual volumes, no doubt, are producing a good effect, and in a few years will infuse new life and vigor in all the agricultural branches, increase their productiveness, and excite a popular interest in these and corelative pursuits. We cannot, however, refrain from thinking that a wider influence would be exerted, and a more lasting benefit would be produced by these reports, if more ample means were placed at the disposal of the board to collect reliable facts and accurate information as to the adaptability of different sections for special branches of agriculture. The public want to know, not only the actual condition of the multifarious branches of industry in the state, but the capability and adaptability of each section for special purposes. Missouri, though historically considered an old state compared with her western sisters, is really the newest state of the west. True, for a long time something has been known of her mineral wealth, and agriculturally she was famous for producing corn, hemp and tobacco; yet, really, she is terra incognita, and in everything that relates to mineral wealth, and natural resources, and capacity, she is an unexplored region. Those who, in times gone by, dominated over her, are responsible for this. Theirs was a dog-in-the-manger policy. They would neither eat the hay themselves nor let others eat it. Hence, her mines are unexplored, the capacity of her soil untried, and her climatic adaptability unknown. Thousands from the adjacent states, from the

northern and eastern portions of the Union, and from Europe, are now seeking homes in her plains and prairies, hills and valleys; but there is no one competent to give them accurate and reliable information as to the best locality for the special branch to which they intend to devote themselves. We therefore hope our present legislature will take a more practicable and comprehensive view of the material wants of the state, and will supply the means to open proper channels to collect facts and reliable information of adaptability and capacity, general and special, of the state, to guide and direct our own people as well as the immigrant.

It is estimated that ten per cent., including the emigration from Europe, of the population of what formerly constituted the free states change their home annually by emigration. This would give about two and one-fourth millions. The tide of emigration follows the sun, and flows from east to west, parallel to the lines of latitude. Slavery in Missouri, and the "Indian wall" west of her, until beaten down, deflected this tide to the north, and made it debouch upon the plains of Iowa, Wisconsin and Minnesota. The central latitudinal development of organizing a cordon of states westwardly from the Atlantic to the Pacific, begun by Jefferson, abandoned and reversed by Monroe and the younger Adams, has been resumed. The system which closed the gates against the flood of free state immigration, also shut them down on the dissemination of knowledge respecting the climate, topography, physical geography, mineralogy and agricultural capacity of Missouri. Consequently, she, in spareness of population is, as we said before, a new state, and physically an unexplored region. She ought to attract and absorb the greater bulk of the two and a quarter millions who are annually seeking homes in the west. But to do this, reliable facts respecting everything relating to industry must be collected and disseminated, or placed within reach of the immigrant. We see no better medium for accomplishing this than the state board of agriculture. But to do so, a more comprehensive organization must be effected, and a more liberal appropriation made to sustain its operations.

As we have already indicated, it ought to be so organized and so operated as to become the fountain head of all knowledge relating to industry in the state. The object of collecting this knowledge ought to be two fold: first, for information generally of the natural resources and capacity of the state; and secondly, for special information, having reference to a special pursuit. It then remains only for us to indicate what additional machinery we consider as necessary to accomplish this purpose.

First, then, the board ought to be required to appoint a chemist to make quantitative and qualitative analyses of soils, minerals, grains, fruits, measures, etc., all of which should be the property of the board. It should be the further duty of said chemist to give, upon application, his written opinion to the board upon the

adaptation of any soil to any particular kind of production, or upon any subject relating to agricultural chemistry; keep a record of his transactions and opinions, and annually report them to the board, with such suggestions and observations as his experience may dictate for the advancement of agriculture; to receive and analyze for a fair consideration, to be paid by the applicant, all soils, minerals, etc., of the different localities in the state; also, the juice of the different varieties of grapes, etc., and report the same to the board.

Second. A geologist, to collect, classify and preserve, in the rooms of the board, specimens of the different kinds of rocks, minerals, fossils, and soils of the state; and to examine the different mineral sections of the same, the condition, progress and improvement of mining. The geologist should be required to make a brief, lucid report, adapted to general readers, for publication in the annual report of the board, and to make such suggestions and recommendations as the interest of his department may require.

Third. The board should have a metallurgist, who should be required to prepare, for annual publication, a record of the various modes of mining in the state, the processes of reduction and separation of the different kinds of metals from their ores, the improvements made in such processes of reduction and separation, and in the machinery used for mining purposes; to collect and place in the cabinet of the board specimens of all kinds of ores, and of the metals in their different stages of reduction, and to make such suggestions for the advancement of this branch of industry as he may deem necessary.

Fourth. To obtain, for publication in the annual reports of the board, a full and popular description of the botanical productions of the state, both native and exotic, the board should be required to appoint a botanist. His duty should be to investigate and illustrate the physiology of plants and trees, and the adaptation of the most useful to our different localities and soils, particularly the varieties of forage plants; to discuss and show the importance and means of preserving and planting forests and woodlands, by our farmers about their homes and on the prairies, not only to afford timber hereafter for domestic purposes, but to make our homes more comfortable by breaking the force of the cold winter storms; and assist in collecting, arranging and classifying botanical specimens for the cabinet of the board.

Fifth. In order to ascertain the pressure, temperature and moisture of the atmosphere, and the quantity of rain falling at as many localities in the state as practicable, the board should be furnished with the means of establishing from fifteen to twenty-five meteorological stations, for making barometrical, thermometrical and hygrometrical observations, and ascertaining the quantity of rain falling at said localities; and to appoint a meteorologist to keep and superintend these meteorological observations and records, and to report them annually for publication to the board, accompanied by such practical observations of their application to agricultural operations as experience may suggest.

Sixth. To obtain a description of, and disseminate information of the animals and birds of the state, and their habits, particularly those that are detrimental or beneficial to agriculture and horticulture, the board should be authorized to appoint a zoologist, whose duty it should be to collect, classify, and preserve in the museum of the board, stuffed specimens of all indigenous birds, and of such animals as may be deemed important, and to report, annually, the progress of the work, with such recommendations for the preservation of the useful, or destruction of those that are injurious, as may be deemed necessary.

Seventh. To describe the insects of the state, their habits and peculiarities, particularly those destructive to fruits and vegetation, the board should have an entomologist, whose duty it should be to collect, classify and preserve, in the cabinet of the board, specimens of all insects, whether useful, noxious or innoxious, and to report annually to the board his observations and suggestions upon their relations to agricultural economy, and the means of preventing their ravages by the destruction of such as are detrimental, and for the preservation and increase of such as are beneficial.

These are some of the means that we conceive necessary to increase the efficiency and usefulness of the board. But there are others that might be suggested. To carry out what we have roughly sketched would require permanent and ample rooms for the cabinet or museum of natural history, soils, minerals, etc. Means ought also to be furnished the board for purchasing standard works on agriculture, either general or special, and of the sciences explicatory of it. By exchanging, the annual reports of other states will be had, yet they will answer but a poor purpose, when any one wishes thoroughly to investigate any agricultural subject. To obtain a thorough and comprehensive knowledge of the whole state, it might be made obligatory on each county to send specimens of the soils, rocks, minerals, plants, timbers, insects, birds, etc., for preservation in the museum.

It may be objected to this programme that no state has thought proper to organize its agricultural board on such an extensive scale. This is true in some respects. But it must be borne in mind that when other states organized their agricultural boards they were old and compactly settled communities. There was not such a wide field for operations, nor so much work to be done there as here. Their natural capacities and resources were pretty generally known and extensively developed. Our condition is the very reverse of this, and therefore, because they have not done so, is no reason why we should not.

Then again, we are not so imbecile as to lack ability to mark out a course suitable to our circumstances that we are compelled to follow the line traced out by others. Missouri is, territorially, a great state, covering an area larger than a half dozen of the smaller states. It would therefore be the hight of folly to put this giant upon the procrustean bed constructed by small states, to reduce her to their pigmy

conceptions. It is one of the plagues of old communities to be the slaves of habit and routine. It is enough for them to know that their fathers, who were so wise and good, did things in a particular way, for them to follow the pattern. New communities have not their thoughts, acts and energies so much weighed down by custom. They have some opinions they call their own, and consequently exercise some judgment on the fitness of things. In this instance the question is not what has been done elsewhere under entirely different circumstances, but what ought to be done here under our peculiar circumstances. We have sketched the prominent points of what we consider ought to be done. The public can see and judge for themselves of the necessity and expediency of the work. We imagine there can be no difference of opinion about what ought to be done, and therefore believe there cannot be much about the way of doing it.

JOHN H. TICE.

PRACTICAL AND SCIENTIFIC AGRICULTURE.

BY G. C. SWALLOW.

"O! happy swains! did they but know their bliss!
To whom the earth, released from all the woe
Of civil broils, gives, with a liberal hand,
An easy plenty, at their just command.
What if no lofty piles, with haughty towers,
A waiving throng through every passage pours,
Of humble waiters in the morning hours?
* * * * * * * *
Yet fraudless innocence and peaceful rest,
Unbounded plains with endless riches blest;
Yet caves and living springs and airy glades,
And the soft low of kine, and sleepy shades,
Are never wanting."

Thus wrote Virgil when the great Cesar had returned to imperial Rome with his conquering legion, and desired his veteran soldiers to forget the glories of "pompous war" in those more genial pursuits of agriculture, which Cincinnatus and other noble Romans had honored by their labors—whose peaceful pleasures the great and good in every age and land have either enjoyed or desired for themselves and their posterity.

But the great men of our own land have been pre-eminent in their love for agricultural pursuits and in their desires and efforts to promote the prosperity and happiness of that class who have done more than any other to secure the power and glory of our beloved country.

They have labored to persuade our youth from the exciting bustle and tempting pleasures of the city to the moral and happy influences of a rural life.

The same high motives have led to the formation of our agricultural associations to stimulate that emulation which rejoices in the success of an honorable rival; to concentrate the experience of the most successful cultivators; and to enlist the aid of science in developing and preserving the rich soils of our state.

When such motives rule, it is a pleasure to respond to your call for an essay upon scientific and practical agriculture.

All experience teaches that the operations of nature are controlled by fixed and uniform laws. Men have ever been anxious to discover these laws and the modes by which they operate. They have observed the operations of nature in all her manifestations; they have interrogated her by experiments in the field, in the work shop, and in the laboratories, and all the important facts have been recorded, until they have become so numerous as to enable us to point out, with more or less of certainty, many of the laws which govern the universe, and to show, in some good degree, their modes of operation.

Now, these laws of nature, thus developed and demonstrated by all the experience of the past, are called science. Those laws or principles on which are based the operations of the farmer, are called the science of agriculture; and the application of those principles in the cultivation of the field and the rearing of domestic animals is denominated practical agriculture.

The principles of scientific agriculture are drawn from several departments of science; the most important come from geology, chemistry, botany or vegetable physiology, zoology and meteorology.

Geology explains the origin and physical properties of the various soils and subsoils, and the position, value and extent of beds of marl humus and other natural fertilizors.

Chemistry teaches the composition of soils and fertilizers, and the various substances which enter into the composition of and are essential to the perfection of the various crops.

Botany or vegetable physiology gives the principles by which plants are developed and perfected, and their adaptation to the various soils and atmospheric influences.

Zoology places at our command the principles by which our domestic animals are improved, also the natures and habits of the animals and insects which are useful or detrimental to the varied products of the farm; and thus enables us to encourage the increase of the former and destroy the latter or provide against their ravages.

Meteorology develops the laws which control the temperature, moisture, currents and electrical states of the atmosphere; and shows the adaptation of the climate to the health and the perfection of the various agricultural products.

To set forth and properly illustrate the principles applicable to

agriculture, from each of these sources, would require a volume (one, too, that should be written and placed in the hands of every farmer); but the limits assigned in this essay will permit me to mention a few only, and show their application to the agriculture of our own state.

GEOLOGY.

As the most essential properties of the soils of Missouri depend upon the geological formations on which they rest, this science is detined to give us material aid in understanding the nature and durability of our soils, and in determining the best method of developing their resources and preventing that deterioration so detrimental to agricultural pursuits.

The alluvial bottoms of our large rivers usually furnish a light sandy, calcareous soil, which contains more or less of the clay and humus deposited in the beds of those ancient lakes and sloughs, now converted to rich savannas by the accumulated sediment and decayed vegetable matter. This soil possesses in an eminent degree all the properties essential to the highest degree of fertility. The fine sands and humus render it light and porous; the humus gives it the power to imbibe and retain moisture; its sand and dark color prepare it to receive the heat of the sun; while the clay and vegetable mold enable it to absorb carbonic acid and other fertilizing gases from the atmosphere.

These alluvial deposits have rendered this soil as durable as it is productive, by furnishing a loose subsoil rich in all the elements of fertility. A soil thus productive and durable, and so admirably adapted to the production of our great staples—hemp, corn and tobacco—and covering an area of more than four millions of acres, is destined to exert a vast influence over the future wealth and prosperity of our state.

But this variety of soil is surpassed in value and extent by that based upon the silicious marls of the bluff, where that formation is best developed, as in Platte, Lafayette, Jackson, Buchanan, Clay, Saline, Chariton, Howard and several other counties of the state. The light porous character and composition of these marls, and the intermingled vegetable matter, constitute a soil unsurpassed in fertility and adaptation to many of our most important crops. It covers an area of at least six millions of acres.

In a still larger portion of the state the excess of clay in the bluff formation renders the soil less pervious to water and atmospheric influences. While this variety is somewhat inferior in nature to that last described, still it may be rendered almost as productive by a judicious system of subsoiling and clovering.

The magnesian limestone, so abundant in the great basin of the Osage and its tributaries, on the Gasconade and in the mining region of the southeast, together with the intercallated sandstones and chert beds and overlaying clays, from a soil at once light, warm and rich in

lime, silex, potash and magnesia. These ingredients, with its location on the sunny slopes and hillsides of those dry, salubrious regions, give it a peculiar adaptation to the culture of the grape.

Thus it might be shown that each geological formation in the state gives a soil peculiar to itself, and more or less adapted to some particular department of husbandry. But other portions of the subject claim our attention.

CHEMISTRY.

Analysis teaches that plants are in a good degree composed of four organic elements—carbon, oxygen, hydrogen and nitrogen—and that they also contain more or less of some twenty inorganic elements, as lime, silica, potash, phosphorous, alumina, soda, etc. These substances are found in different portions in different species of plants; but it should be remembered that a perfect plant of any given species contains nearly the same elements, and those elements in about the same proportions, as every other perfect plant of the same species. This law* of the vegetable kingdom lies at the foundation of agricultural chemistry, and upon it is based the whole theory of adaptation of soil to the crop.

Chemistry also gives us the composition of the soil, by which we may determine whether it contains all the ingredients necessary to the full development of any given crop. Should the cultivator desire to raise any particular crop to which his soil is not adapted, and analysis has shown what particular element is deficient, chemistry will again come to his aid and indicate with certainty what substance will supply the ingredient needed. If carbonate of lime be wanting, it points with confidence to our marl beds and the subsoils of our bluff formation; if humus be deficient, the immense vegetable deposits in our ancient lakes and sloughs will furnish what is desired; or the requisite amount of vegetable matter may be supplied more economically in many localities by turning under such green crops as clover and buckwheat.

PRACTICAL AGRICULTURE.

Good common sense and a little reflection will enable us to make a successful application of the principles of agricultural science to the practical pursuits of the farm. Geology has shown that each formation in our state has produced a soil peculiar to itself and well adapted to some one of our staple crops. The farmer, therefore, should select the soil best suited to the crop he would produce. He will not sow his hemp on the loose, calcareous and flinty soils, which rest upon the declivities of our magnesian limestone bluffs, nor set his vineyard in the moist, rich, alluvial soil, amid the dense vapors and shades of the Missouri bottom.

*There are one or two apparent exceptions to this law; under certain circumstances lime and magnesia will replace potash and soda, and vice versa.

The farmer of Lafayette or Platte, who cultivates his thousand acres of "the best soil the sun shines upon," may smile at the simplicity of the German who builds his cottage under the sunny bluffs of the Gasconade; but his delicious purple clusters and four hundred gallons of pure catawba per acre will yield as much pleasure and profit as the thousand pounds of hemp of his more ambitious neighbor.

But the physical properties of defective soils may often be so changed by mechanical means as to render them highly productive or give them a particular adaptation to some desired crop. When the subsoil is so compact that the water passes off over the surface, bearing away the best ingredients of the soil and cutting channels and ravines, a judicious system of subsoiling and clovering will so loosen the texture as to permit the water, heat and air to penetrate through it, and elaborate the food suited to the vegetable economy.

Again, such impervious soils retain so much water in the rainy seasons as to prevent cultivation and injure the seeds and roots by long maceration; whereas, in drought they bake and crack to a very injurious extent for want of the moisture usually obtained by more porous soils from the reservoirs below, through capillary attraction.

Our stiff, cold soils may also be prepared for the culture of the grape by deep trenching with the spade or Irish plow, and adding large portions of sand and flint pebbles. The depth thus secured will give sufficient space for the roots and the elaboration of the necessary food; the sand and stirring will render the soil light and porous, and increase its capacity to absorb and retain heat; while these changes combined will secure it against the injurious effects of drought or excessive rains.

This department of our subject also indicates the means by which our soils may be prepared to withstand the dry seasons so frequent in our long, hot summers. In the absence of rain the soil is supplied with moisture from the air by absorption and from the subsoil by capillary attraction. Other things being equal, the soils which contain the most humus and carbonates of lime and magnesia, will absorb most moisture from the atmosphere; while the deeper and looser the subsoil the more water will it be able to supply the soil through capillary attraction. It is therefore evident that subsoiling, deep, thorough and frequent tilling, and the addition of vegetable matter by clovering or other means, are the best methods of preparing the soil to sustain the frequent droughts incident to our climate. The same preparation will also enable it to receive with less injury our excessive rains; as the superabundance of water passes down into the subsoil, when it is sufficiently loose, instead of remaining on the surface or running off, and thereby carrying away the wealth of the soil, and cutting ditches and ravines through the field.

Geology also furnishes some important suggestions to aid us in draining and reclaiming swamp land. Many of the swamps in the Missouri and Mississippi bottoms are underlaid with strata of sands,

so loose that water readily passes through them. This fact is abundantly proved by the connection between the water in these rivers and in wells in their bottoms. It is therefore evident that the lakes and swamps in these bottoms may often be drained by excavations through the clay, on which they rest, into the sand strata below.

Chemistry gives the practical cultivator the most infallible data for determining the adaptation of crops to soils. When the analyst has ascertained the composition of the soils and crops, it will be easy to decide whether the chemical constitution of one is suited to the full perfection of the other. The indications of this science are also valuable in deciding other important questions in agriculture. When land is exhausted by cultivation, analysis will show what ingredients are deficient and the proper method of restoring its fertility.

Again, should two crops yield equal profits, while one impoverishes the soil more rapidly than the other, the judicious cultivator will choose that by which his lands are least deteriorated; as every degree of exhaustion of the soil is so much productive capital withdrawn from this bank of the agriculturist. The transcendent importance of this subject may be estimated by the exhausted plantations of Virginia and other old states of our Union.

Hemp and tobacco will give us a good illustration of this subject. Analysis shows that the leaves of tobacco (all that need be removed from the soil) contain twenty-five per cent. of lime, silica, soda, potash, magnesia, iron, chlorine, sulphuric acid and phosphoric acid, which are the most valuable ingredients of the soil; while hemp lint contains but one-fourth of one per cent. of the same substances. These facts show that every ton of tobacco takes five hundred pounds of the best fertilizers of the farm, while the same amount of hemp removes but five pounds of the same materials. These facts prove that one ton of tobacco impoverishes the soil more than one hundred tons of hemp, as a soil in good cultivation is constantly gaining fertility from the atmosphere, the subsoil and decaying vegetation.

Hemp also has the advantage of tobacco in protecting the soil from the rays of the sun during its growth and while rotting, if it be spread on the ground where it grew. The soil is thus shaded and kept moist during a large part of the year; whereas, in the culture of tobacco, it is exposed, for a much longer period, to the burning rays of the sun. Now, it is a well established principle of agricultural science, that a soil while moist and loose is in the best possible condition for absorbing fertilizing gases from the atmosphere and for elaborating the vegetable food contained in its mineral ingredients.

This science also points out the relations of these principles to other crops of no less importance, but space will not allow us to consider them here.

Vegetable physiology teaches us that plants draw a portion of their organic elements from the air, through their leaves, and the remainder of the organic and the inorganic from the soil. Now, an

acre of wheat, well dried, contains about three thousand pounds of organic and two hundred of inorganic elements—about a ton and a half per acre for each crop of wheat. It is evident all the inorganic and some of the organic elements must come from the soil and the remainder of the organic from the atmosphere.

To be more definite: every acre of wheat takes from the soil seventeen pounds of phosphoric acid, two sulphuric acid, one chlorine, sixteen lime, thirteen magnesia, thirty-two potash and soda, one hundred and twenty-one silica, two iron and alumini—in all two hundred and five* pounds every year. Such a draft upon these substances, must evidently exhaust the supply, as some of them exist in small quantities only even in the best soils. This has been the sad result in some of the richest portions of our country, as in Virginia, Maryland and New York.

Science points out several methods by which this rapid exhaustion may be prevented, or at least retarded:

1. When any of these substances have been too much reduced in the soil, they may be restored by placing upon the land the most convenient fertilizers which contain them. If, for instance, phosphoric acid be deficient, use bone ashes; if chlorine or soda, apply common salt, as it contains both of those elements.

2. Other crops are sometimes grown and turned under. Clover is well adapted to this use when the soil is exhausted by wheat, as a crop of clover, besides the roots and stubble which are also turned in, contains of

Sulphuric acid	7	pounds,	5	more	than	a crop	of wheat.
Phosphoric acid	18	"	1	"	"		"
Chlorine	7	"	6	"	"		"
Lime	70	"	54	"	"		"
Magnesia	18	"	5	"	"		"
Potash and soda	77	"	45	"	"		"
Silica	15	"	106	less	"		"
Oxide of iron and alumina	1	"	2	"	"		"

From this it will be seen that a crop of clover will restore to the soil more of all the substances removed by wheat, save three: silica, iron and alumina; and these three are so abundant in our soils that we need not fear their exhaustion. But when the exhaustion is produced by corn, buckwheat may be used for the restoration.

3. A judicious rotation of crops will much retard the exhaustion of the soil. This method is practiced with success in some parts of our country, and is in great favor both in England and on the continent of Europe.

4. Deep and thorough cultivation will succeed better than any other system on most of our soils in Missouri; or, what is better, a combina-

* Of this about thirty pounds come from the grain and one hundred and twenty-five from the straw.

tion of clovering and subsoiling will most effectually preserve our rich soils in all their primitive fertility and save us from the misfortune of cultivating impoverished lands, and the mortification and sin of handing them down to the next generation.

Besides all the advantages of deep plowing already mentioned, it may be proper to refer to one more.

When a crop is cultivated in the same soil for several years in succession, it often happens that the last are much lighter than the first, because, as it is generally supposed, the ingredients of the soil necessary to sustain the crop have been exhausted. But, if such lands are permitted to rest a few years, and are then cultivated in the same crop, the yield will be greatly increased, showing that all the necessary elements were in the soil, though not in a suitable state to nourish the plant; and that during the years of rest the needed ingredients had been prepared by the action of the mutual affinities of the elements of the soil, the water, and the atmosphere, and its accompanying gases.

In the present state of our knowledge it is impossible to tell what must be the exact preparation of any particular element to fit it for the reception of the plant. Yet we do know many of the conditions most favorable to this preparation, and that it is a slow and gradual process. The soil must be well pulverized and in a condition to admit the free access of moisture, air and the heat of the sun. When these conditions are fulfilled in a good soil, the food of the plant will be properly prepared for its nourishment. It is evident, therefore, that the amount of food prepared in any given time will be in proportion to the amount of soil subjected to these conditions. It is also evident that these conditions do not exist in the soil below the point reached by the plow. These deductions place us in a condition to appreciate the most important advantage of deep plowing—it places more soil under the conditions most favorable to the elaboration of vegetable food.

If, therefore, twelve or eighteen inches of soil be cultivated instead of six, the crop will be increased and the deterioration greatly lessened or entirely prevented; as the supply of nourishment will be greatly increased by thus placing so much more soil under the conditions most favorable to its elaboration. The increased quantity of soil thus placed in reach of the roots will also prevent its exhaustion, or at least indefinitely postpone that disastrous event.

Whether our soils shall be preserved, is one of the most important questions in both practical agriculture and political economy. Our future greatness depends upon it. Then let us ever act upon the principle that our rich soils shall be preserved in all their primitive vigor.

It would be interesting to show how meteorology aids the cultivator by showing what crops and what fruits could mature in our summers and withstand our winters, and what can endure the heat and drought of our summers. In short, there is no science, no object in na-

ture, that does not in some way aid the cultivator of the soil; man is lord of all, and all nature conspires to aid him in this the natural, the great pursuit of his life.

For countless ages animals and plants have been perishing, and depositing their decayed remains in the earth, to furnish food for the succeeding generations of the vegetable kingdom. The plants and trees in families and species almost numberless; the animals, the beasts of the fields, the fowls of the air and the fishes of the sea; the countless myriads of insects and animalcule, all draw their nourishment from the bosom of the earth, our common mother, and in death, all return to her, the common grave of all the dead, there in turn to nourish those which follow in the great succession of life. All nature, then, comes to aid the farmer in his vocation. Every department of nature furnishes him lessons of study, which may add to the pleasures and profits of his noble profession.

It is a time honored maxim that the youth should study what the man is to practice. The whole business and duty of the farmer may be expressed in two words—aid nature—make two blades of grass grow where but one grew before—cultivate the crab apple until you convert it into the delicious pippin—transform the snarling wolf into the sagacious and magnanimous New Foundland dog—such are the ennobling duties of the farmer; his labors are with nature, and his success must depend upon their accordance with nature, or the laws of natural science, which are thevery essence of all the experience of all the past. Famers, then, above all men, need a thorough knowledge of true philosophy and genuine science. Let those, therefore, who would be farmers and who would excel in the profession, study the natural sciences, and particularly those departments which lie at the foundations of practical agriculture.

WHAT IS GRASS?

An address delivered September 20, 1866, before the Columbia county, New York, Agricultural Society, by Solon Robinson.

WHAT IS GRASS?

This is the title of my present discourse. I intend to answer that question. Perhaps it is arrogant in me to undertake to do so, since many hundred years ago an inspired poet has already answered it in the fewest words ever used in solving an important problem.

You will find that answer in a book of superlatively beautiful poems, which some of you have at home—which some of you have read—which some of you think not worth your while to read, because the old book has been so long in the house. But you will find some very good reading beside the answer to this question, which says: "All flesh is grass." [Isaiah xi, 6.]

I intend to amplify this answer to my question, because I am afraid some of you have never read it, or else you have not fully comprehended its import.

Perhaps you will think it is arrogant in me to come here to tell these grass farmers "what is grass." If you do, I shall not be disappointed; I shall be, and so will you, if you look to me for an exposition of a great new agricultural doctrine. I am not a professor of any new science. I do not often deliver agricultural addresses. As a general thing, they are not instructive. I do not intend to try to-day to instruct you about farming. Perhaps in this talk about grass I shall be able to tell two or three of you two or three useful facts—at least, I will try to make you think, after you return to your own homes, whether there are not some improvements in farming which you can easily make.

Do you know what is the first step requisite for improvement? It is to be convinced that you do not already know everything that is necessary to be known about farming.

The next step is earnest, studious thought. It is the besetting sin of farmers not to think. A great many of them never read, that is, anything which has any connection with or gives any information about their business. Some of them have not an agricultural book in the house, many of them never take an agricultural paper, and there are men who call themselves farmers who never attended an agricultural fair. I doubt much if a majority of those in this county ever contributed so much as an ear of corn toward the maintenance of this agriccultural society. They have always said "what's the use?"

Perhaps that class will not be satisfied to hear me say to-day, there is no class of men so reckless in their work as farmers, none who do it with so little thought, none who work so hard for the money they obtain; and no wonder, for there is no class that works with so little system, forethought, or calculation that will result in a certainty of receiving compensation for the labor bestowed.

An architect about to build a house draws a plan, and counts every brick and foot of lumber and cost of lime, nails, glass, paint and labor before he begins his job.

Not one farmer in ten knows the cost of a job after it is finished. They grow particular crops year after year, and use or sell them at the market price without knowing anything of their cost, or whether it is more profitable to grow one than another.

Is there one man here who can tell me the actual cost of the last hundred bushels of wheat, corn, oats, rye, barley, buckwheat or potatoes that he has produced, or whether one is more profitable than the other?

Is there one man here who can tell me the actual expense of producing one hundred pounds of butter, cheese, beef, pork, or any other farm products in this county?

Who can tell how many pounds of corn will make a pound of pork?

Who can tell what particular branch of farming is most profitable in this county, and why it is most profitable? And, after counting interest upon the value of land and all its appurtenances, and the net results of sales of products, who gets the largest monthly wages for his labor, the owner or the hireling upon the farm?

These are some of the things that I would have farmers think about. I would have them study and understand the principles of their business, and conduct it more upon system, such as a successful manufacturer applies to his business, and not take the chances, hit or miss, like a New York speculator in petroleum.

A farmer is a manufacturer as fully as he who cards and spins cotton. His farm is his mill; the rains, dews and sunshine furnish the water power; his seeds and fertilizers are the raw material; and as he has ascertained that he can increase his crop by the use of manure, it should be a study with him how much of that raw material he can work up in his manufactory into salable products. And it should not be a study, but a certainty, what those products should be to be most profitable, and he should know to a cent what each article that he manufactures costs, quite as surely as the manufacturer knows the cost of a yard of cotton cloth.

These are some of the things about which a farmer should think.

This county is specially devoted to grazing and haymaking. I am aware that I shall be told that selling hay is more profitable than feeding it at home, but I shall not be quite sure of the fact, although the fact may be cited of two noted cases in the county where all the owners had for profit after feeding flocks of sheep all winter, was the manure they made. But those were only extreme cases, and I believe the owners would repeat the operation next winter with the same results rather than ship their hay and straw to New York.

I have seen in this country a good deal of land which I call sadly worn out by bad farming. I have seen oats sown upon corn stubble, rye upon oat stubble, and the rye stubble turned under for a crop of corn again the next year. Perhaps that kind of farming is profitable—I don't believe it. I don't believe it profitable ever to sow small grain without seeding land to grass or clover. I believe clover seed the cheapest manure ever bought by a farmer. It will pay well to sow clover

with rye and turn it under for a corn crop the next season. It will pay better to let it stand over one year without mowing, and with but little grasing, turning in the full crop to rot and fertilize the soil. That and the subsoil plow is what is very much needed upon many of these farms.

But, like some other preachers, I have wandered from my text. Although many of you are grass farmers, how many of you now before me have ever thought of this great fact—that grass is the most important crop ever grown. Most important; not only so, but more than all other crops combined. Let us dwell a moment upon this fact, for I have come to ask you to think, not to listen to any nonsense about farmers and the superiority of their occupation, because they are not superior, but lamentably ignorant.

You have heard in times past—past never to return—that "cotton is king." Probably some of you have believed it, and have since repented of the error. Probably some of you have thought that the world was ruled by gold. I know that you have heard, read and talked of the power of commerce. I tell you there is a greater power—a stronger ruler—a more potent king—than cotton, gold, or commerce. And this power you hold and sway in your own hands.

Grass is king. It rules and governs this world. It is the very foundation of all commerce. It is the most important crop ever grown upon the face of the earth. Without it the earth would be a barren waste, and cotton, gold and commerce all dead. Grass is the all in all to all men.

No wonder then that he has always been considered a wise man who said: "He that maketh two blades of grass to grow where only one grew before is greater than he who buildeth a city." That is, builds a mart of commerce—a store house for cotton—a place of deposit for gold.

What is grass? Have you ever thought? I am sure some of the younger portion of my audience have not. It is the shoes upon your feet—the hats upon your heads—the coats upon your backs. To-day, like the cattle in the field, you dined upon grass, and you will sup upon the same, and sleep upon grass to-night. Did you eat beef, or mutton, or bread for your dinner? What were they last week, last month, last year? Nothing but grass. Will you eat butter and cheese and milk for your supper? Some of these were grass this morning or yesterday. So rapid has been the chemical work of changing one substance into another, in nature's laboratory, that you have eaten grass scarcely a day old. It has not had the same time of preparation that you gave it when cured for hay. If you sleep to-night, as every sensible farmer will, upon a bed of rye straw, you sleep upon pure grass; for that and wheat, oats, barley and Indian corn, in botanical classification, are all grass. Every woolen garment you wear is but the chemical concentration of grass in the sheep's stomach into wool. Those stout leather boots and shoes upon your feet were growing last year upon the hillsides, green as grass; and if you would not wish to be supposed equally green, you must consider all these things. Consider that as growers of grass, you are the most important class of people on earth, and arouse yourselves to a due sense of that position, and feel a degree of pride in accordance. For it is a proud position for any mortal to occupy, to be one of those who control the whole commerce and manufactures of the world. Without grass the world could not exist.

But for the green covering of these hillsides, New York city would have remained as it was at first, an island of rocks and sand, deep vales and high hills, salt marshes and muddy shores. Where palaces now stand the ducks would have been still swimming, and the deer that lay down quietly in Central park would have run wildly at the approach of man through the tangled jungle of brakes and green briars of a desert. Through Fifth avenue there would not have rolled one unceasing throng of carriages toward this great city pleasure ground, for there would have been no Fifth avenue, no Central park.

The pride of arrogance and gold in that throng may tell you that Fifth avenue and all its appurtenances was built of cotton; that palaces are piles of pork; and all these vehicles only the vehicle of affluence grown of commerce. I tell you they are gamblers' gains in gold, and that all this evidence of wealth is but grass—grass that perisheth. Without it not one of these purse proud people could have even a piece of bread and cheese to satisfy their hunger. Without it they might hoard their gold and buy and "hold stocks for a rise," but they could not butter a single slice of bread.

You, farmer's boy, in your visit to the city, may stand some day upon the foot walk of that Fifth avenue, or Broadway, and gaze upon the living stream flowing by, and wonder whereof it all came. You may stand and look with admiration on what appears to you a vast accumulation of wealth. You see before you splendid carriages, horses with their trappings and drivers, and beautiful forms of men and women. Let me lend you my magic eye glasses. Now look again! What do you see? Grass; little else but grass—an endless windrow of grass, moving past your vision like a flowing stream. You are in a very sea of grass. All else are mere bubbles of froth and driftwood. You have before you an endless panorama of hay cocks, windrows and wagon loads of hay; grass here, there and everywhere. You lift the glasses a little and see horses. Look again!

They have turned to grass—hides, hoofs, hair, flesh, bone and blood; only yesterday, as it were, in the great account of time, these were all grass! These beautiful spirited animals came from the farmer's great factory. Figuratively speaking, he put grass into the hopper, and these horses were the result. The leather of the harness, what is it? The skins of bullocks fed upon grass. The carriage is of wood and iron, but it is still grass, for without that the artisan could not have lived who wrought the ores and forest trees into this beautiful shape. That driver is proud of his high-topped boots, boots made of grass. He imagines, perhaps, they were made from the hides of some of the millions of bullocks which have been sold upon this same Fifth avenue. True, they were hides, hides were skins, and skins were grass. Gaze on, O youth, at the beauty of the lovely faces that are floating in this great panorama, these living things of flesh and blood, these men, women and children; but in your admiration, I pray you do not forget that "all flesh is grass."

You may go back now to your native hills, and walk proudly over your mountain pastures. You may sing merrily to the music of your mowing machine—more merrily than you ever did before; for now you have learned how to measure the value of the product of your labor.

You have learned how to laugh at the folly of those who worship at the shrine of the defunct "King Cotton," who at best was nothing but a miserable usurper of the throne.

To grass your eye is now directed,
Since cotton's counterfeit you have detected;
Then learn to toil and gaily sing,
All flesh is grass, and grass is king.

I believe I have answered my question and might stop at this point. I am sure, from what I have said, you will never forget the importance of this great crop. There is, however, one great truth connected with this subject which you have not sufficiently pondered. It is simply this: Through all this country two blades of grass can be made to flourish where only one is now feebly growing. It would be difficult to convince me that there is a farm in this county upon which the annual product of grass could not be easily doubled.

I think I hear the little word "how" whispered near me. There is something like a hum of "how" floating through the air. Perhaps I cannot tell you how, yet I dare you to tell me it is not the fact. Go yourself and examine the sod of your best pasture or meadow. Is it all grass? Is not one half the space occupied by some worthless plant, which fills up room and draws sustenance from the earth, but gives none to the stock that graze upon it, nor to the cattle that eat the hay made from the meadow? I see many fields covered, almost to the exclusion of green, rich, nutritive grass, with white daisy. Does that make good grazing for summer or good forage for winter? If so, I have nothing to say to the daisy farmers. They are wedded to their ways, and prefer to grow ox-eye to ox-feed of a more nutritious character. I prefer to grow grass, and therefore bid the daisies depart from me as an accursed thing.

I wish that I could destroy all other weeds as easily as this one. "How?" Yes, I will tell you that, and at the same time I assure you that you will greatly promote the growth of grass, or almost any other plant useful to man.

I have seen some hay fields the present season where three-fourths of the weight of the crop was daisy. At a little distance it appeared to be all daisy. This was the case in a field at Auburn. The fleabane overgrew the clover.

Such a field as that I think I can clear of this pest of all good farmers at a cost not exceeding three dollars an acre, even here where transportation is not expensive. I did it upon my own place, in Westchester county, at less than one dollar an acre. Again you ask, how? I answer: With salt, nothing else. That is sure death to daisies. At first, I used three bushels, not being quite sure of the effect. I think that I got a ton of hay from that three bushels of salt, which was applied in the spring, about the time the grass began to look green. Upon the stubble I put seven bushels more, and since that time, I have applied ten more bushels. The cost in New York was six cents a bushel at the packing houses, where it is brushed off of dry salted pork.

When I bought the land it was as thickly set with daisies as any field I ever saw. I did not believe in them for hay nor pasture. I did not know that salt would kill them, but I found the first dressing greatly diminished the slovenly farmer's crop.

The second dose did the work. I found next mowing time, where they had predominated over all the grasses for years, scarcely a single bull's eye to be seen upon an acre. In their place came white and red clover, timothy, red-top and June grass.

Do the farmers of this county esteem these better than daisies? I do. If you do not, why all got I have to say is, this is (now) a free country, and you may grow them. I shall salt and kill them. I had rather grow clover and grass.

But killing daisies is not all the benefit that I derived from salt. It killed the worms, and the moles, not finding their accustomed food, discontinued burrowing under and killing the sod, and it grew and flourished.

But that is not all. Manure is good for nothing until it has met with a solvent. Some vegetable substances are not soluble in rain water, and although capable of making good manure, are good for nothing in their inert condition.

The action of salt, lime, plaster, potash, etc., upon dead inert vegetable fiber in the soil, is to cause it to decay and become food for the growing grass.

Dig up a sod in any old hide-bound meadow or poor "runout" pasture, and you will find it full of black dead roots. If you dig again after the action of the salt or other mineral manures, you will find a different and more favorable appearance, and certainly you will find a very great difference in the product.

In short, you have made two blades of grass grow where only one grew before.

What, if over all this country the same result could be produced?

Who can calculate the increase of wealth? It alone would forever pay the interest upon the national debt, and that, at least, would prove a national blessing.

But the benefit of these "mineral manures," as they are sometimes called, is not alone to reduce inert vegetable fiber to a condition that makes it available for growing plants. It enables you to make the stalks of grass, oats, barley, rye and wheat stand firm, and hold up their heads for the sun to ripen the seed.

What would some of you have given the present season to stiffen your straw? It is quite as necessary for you to know how to do so as it is to keep "a stiff upper lip" and a stout back bone. It is perfectly easy for any man with a clear conscience to make his rye stand up until it ripens. If salt will not do it, salt and lime will.

Saturate water with salt, and use the brine to slake the lime. Expose that some weeks to the air, under a shed, and apply twenty or thirty bushels to an acre when you sow your grain, and two bushels of plaster upon the growing plants in the spring, and if your land is manured properly, or is as rich as it should be, you will double the ordinary product and your grain will not fall down, though you ought to, and worship the good Providence which enables you to grow such bountiful crops as you may obtain by underdraining your land; by deep surface and subsoil plowing; by sowing clover and grass seed with every grain crop, Indian corn and buckwheat included, and by the use of such fertilisers as will not only stiffen the straw, but double the crop.

I assert that all the crops of this county can be doubled, while the profits to the farmers will be very much more than doubled, for the cost of production will be only slightly increased.

At present the rule of most farmers appears to be: "How much surface can I spread my stock of manure over, or how many acres can I plow and cultivate in my way—that same good old way of my grandfather—with what manure I have on hand?"

It seems to me that some farmers think more of how little manure they can get along with than how much they can use to advantage.

The study should be: "How much manure can I use in this my great manufactory of grain, of grass, of beef, butter, cheese, mutton, wool, and all other salable products of my farm with profit upon their purchase?"

If a farmer pursued this course he would have no occasion to ask, what is grass? nor where is grass? It would be all around him, in such abundance that he would soon agree with me that "grass is king"—that it is the most important cultivated crop in America. That it is the very foundation of our national wealth, and that every effort of enlightened and improving farmers should be to double its present production. Every man is a benefactor to his country who does himself, or can induce another to make two blades of grass to every one now growing.

And every farmer who thus increases the national wealth by increasing this great American product, will at the same time increase his own wealth, comfort and prosperity, and advance the great cause of civilization.

Upon this point let us pause.

I want you to pay particular attention to this bold, and for ought that I know, original assertion, and then study history and see if you can disprove it. I assert that no country ever advanced to the highest grade of civilization, that did not advance over a firm grass sod.

By any other road it is impossible to reach that point. A few nabobs are found amid cotton fields and rice swamps, or where sugar is extracted from the earth by the lash of the slave-driver; but civilization and its adjuncts of schools, churches, and rural fêtes like this, are not to be found in perfection in any but a great grass growing country—a country that produces horses, cattle and sheep—a country that provides the rest of the world with beasts of burden and war and means for their sustenance—a country that produces beef and mutton, and leather and wool, and furnishes the

regions that are bare of grass with butter and cheese, and the means of sustaining life in a comfortable condition.

Such it is to live in a grass growing country. Such is the reason that I dwell upon this theme. It is not only to convince you, but to give an argument to the world, that your position is a proud and commanding one, and I want you to improve and enjoy it, you and your children, and your children's children, even unto the third and fourth generation.

I want you to be convinced of the great importance to yourselves, and all the rest of the world, of making two blades of grass grow where only one is now growing.

To look upon this subject in its true light, you must first become fully satisfied that cattle—cattle in the broad sense of the word—are the great source of accumulating wealth in this broad country. When you fully appreciate this fact, you will not only exert yourselves to produce more and better grass crops, but you will feel the importance of improving your grass consumers.

You will then breed animals with a design to increase their value and your wealth.

I am aware that this section is somewhat noted for the production of good horses. The evidence is certainly before me. But what if the contrast was here on exhibition? I venture to say that colts are produced every year, even in this county, which are like the Dutchman's picture, under which he wrote: "This am a horse."

I have seen some living specimens which needed similar labels to distinguish them from mules.

If it is important to make two blades of grass grow in place of one, of how much more importance to produce a colt of the highest value in place of one that any respectable farmer would not allow upon his premises.

As dairymen, you have learned the advantage of improving your breed of cows.

Have you learned all, and do all practice upon these principles, that the value of all the cows in this country can be doubled?

Are there not still to be found some of the genuine breed of scallawags?

Are not calves produced every year which belie all of our assertions about the general improvement that has been made in our neat stock?

I have often recommended the managers of our annual shows to purchase and exhibit specimens of the meanest stock to be found in the surrounding country, to show the contrast in the strongest possible way, between such and that which has been improved by careful, judicious breeding and attentive feeding. It is the only way to make farmer Shiftless feel that his stock is inferior to that of farmer Thrifty.

In producing a new breed, or rather in improving the old one, all that a farmer need to study is what will produce what he wants, and then set himself diligently to work out that purpose.

No one who kept a herd of cows for the purpose of sending milk to the city would think of buying Alderneys, nor crossing the native stock with that breed. But for a butter dairy he might very well think of infusing into his herd the blood of a breed of cows which have been long celebrated as butter makers. In short, every farmer who raises calves to make his own cows should inquire whether he cannot improve their quality for the special object he keeps them for, whether for milk to sell by the quart, without regard to the quality, or for butter, for which he wants them of an entirely different character from those intended for making cheese.

The want of system in breeding is a fatal error. Indeed it is the great error in all farm operations.

I have often heard a farmer say that quantity and quality of milk was all owing to feed.

Are there any persons present who believe this doctrine? I assure them it is only true in a limited sense. The quality of a cow for milk is in a great measure artificial. In her wild state she would yield barely milk enough to support her calf until it could eat grass, and then the milk secretions would cease. If you should catch and tame such a cow, she would be of little value in a dairy; and it would take several generations of calves, and careful artificial breeding, to make a strain of good milkers.

In this case the change, after a few generations, and crossing with noted milkers, would be so marked that no one would doubt the improvement.

What I want to impress upon your minds now is, that you may improve your present stock so that the change would be almost as palpable as in the other case.

There are several noted instances on record of great improvements made upon the common stock of this country, by continuously selecting the very best cows for butter, cheese, or quantity of milk, and breeding them to males out of cows of the same character. A noted case of this kind was that of Colonel Jaques, of Charlestown, Massachusetts, who made a breed of cows that became celebrated as the "cream-pot breed." A similar result was produced by Major John Jones, of Delaware. It is also well known that some of the best cows in this country have been made by judicious crossing with some of the artificial breeds of England. I have myself a most excellent

family cow, half and half Ayrshire and Alderney. She gives the rich milk of the latter, increased in quantity, while in appearance she is Ayrshire in color and Alderney in form.

To produce improvement in any stock, you must aim for a result and labor for that aim perseveringly.

I am willing to admit that much of the value of dairy products is owing to local circumstances —to soil, climate, water, and sweet rich grass; but you should not rest easy upon that, because you are in a highly favored region; you can and you should improve your breed of cows, and you can and should improve your pastures and mowing fields.

One of the most successful milk dairymen of my acquaintance pursues a course that I was at first disposed to condemn; but I am convinced by figures that he is right. In purchasing cows, which he does every year, he always selects the largest, or those that appear most likely to fatten easily, and whenever they get fat enough to sell at a handsome profit to the butcher, they are disposed of and their places filled by others. In this way he makes two profits out of one purchase. He might have made a little more out of his milk if he had selected for that purpose alone, but he finds it most profitable to combine the two objects.

His success is worthy of your consideration. He never allows himself to become attached to a cow to such a degree that he will not sell her whenever his price is offered. His is a true mercantile or manufacturing business. He studies how he can make two blades of grass grow this year to one last, and how he can best dispose of the grass at a profit, which he does by converting it into milk and beef. One of his rules is, never to have a short pasture. If grass begins to fail, a part of his herd is always in condition for the butcher. He does not adhere to any particular breed. He buys any cow that looks promising for profit. He is not a breeder. That is not his business. He is a buyer, feeder, milker, and seller of cows bred by others. It is in this exactly as though he should buy horses and wagons, which he could have the use of while he kept them, and resell at a profit. Another man might be a manufacturer of cows, and it would then be as important that he stocked his manufactory with the very best materials, as it would be if he was manufacturing agricultural implements of wood and iron.

I am sorry to say, that in the great cow manufactory of the country the disposition of the owners appears to me to be to select the very worst materials. If a very promising bull calf happens to come into existence, he is promised to the butcher. If there is one that is so mean that the butcher will not have it, he is permitted to live in his natural condition, perhaps out of pure neglect, until he finally assumes a sort of semi-respectability, and becomes a propagator of his race. The result is a mean race of calves.

I have seen thousands of this class of animals sold in the New York market, often in droves of twenty to sixty, collected in the interior of this state, perhaps fed at some distillery to fit them for the butcher, and I have never looked upon such a collection without wishing there was either a statute law, or one of common sense, to compel the castration of all such animals—animals that are calculated to do more harm to the great farming interest than the same of number wolves and bears turned loose; for they would be destroyed, as the bull should be, without mercy. And until it is done, you never will succeed in working out a great reform in the improvement of the breed of dairy cows; and allow me to tell you that the first step toward improvement is to become convinced that you have not already got the best in the world. Believe that somebody else has got better than you have, and you will never rest satisfied until you obtain some equally good.

In the purchase of dairy cows, experience has given some rules that the inexperienced purchaser may profit by studying. These are some of the points that mark a good milker: Head small, long and narrow toward the muzzle; horns small, clear, bent and placed at considerable distance from each other; eyes not large, but brisk and lively; neck slender and long, tapering toward the head with a little loose skin below; shoulder and forequarters light and thin; hind quarters large and broad; back straight and joints slack and open; carcass deep in the ribs; tail small and long, reaching to the heels; legs small and short, with firm joints; udder square but a little oblong, stretching forward, thin skinned and capacious, but not low hung; teats or paps small, pointing outward, and at considerable distance from each other; milk veins capacious and prominent; skin loose, thin and soft like a glove; hair short, soft and woolly; general figure, when in flesh, handsome and well proportioned.

I do not expect you to find all these points united in one animal, but a majority of them should be. When you get such a native cow, you should breed her to some full blooded bull of one of the improved breeds of cattle, and the offspring will be likely to be more valuable for the dairy than full blooded cows would be, whether Durham, Devon, Hereford, Ayrshire, Alderney or Dutch; each of which are valuable for certain purposes. In this country the grades of all of those breeds have proved the most valuable for the practical farmer.

In the western states the introduction of the Durham blood has given more wealth to the farmers than any gold mine ever did to the mass of the people. That stock is exactly suited to that country—it might be quite unsuitable to this.

I do not intend to give specific instructions; I only repeat, the special object must be kept in view. Do not attempt such a work as an improvement of your stock without first considering what you desire to attain. Do not, whatever you do, attempt to get rid of all the characteristics of the native breed; because in that you already have some of the very best characteristics of any breed of cattle in the world; and if half the money had been spent in improving it which has been in importing new ones, we should now have a breed called native cattle which we might well be proud of, for our own use and exportation.

Take the native breed as it is in this country, and it would probably be very difficult to obtain a foreign one so well adapted to the geological character of the land, the natural productions of the soil and climate, and in all things so well suited to the wants of the people. Therefore I urge it upon you to foster and improve your native stock, as well as the grass they live upon. It is a subject of vital importance to the country, and it is quite too much neglected. It is because you do not think, reason, reflect, and then improve.

As I have already, as I think, demonstrated that the grass crop is the most valuable of all crops grown in America, I wish to impress it upon your minds that it is a mere raw material, too bulky for transportation in that condition, and therefore to derive its full value it must be manufactured—condensed—upon your own farms; and to do that to advantage you must have good machinery; and that machinery is the best breed of cattle which it is possible to obtain.

Upon the manner of conducting this great manufacturing business—this conversion of grass into salable, exportable goods—depends the prosperity and future greatness of these United States—the dominions of king cotton included. Prosperity does not depend upon cotton, nor any other great staple crop. It depends upon grass, and the way the grass-growing farmers use this great national product, without which there can be no national prosperity.

It is this view of a great indisputable fact that I want you to consider, and then you will feel your importance in the scale of civilization, which is to be upheld by you—the American grass-growing farmers.

I want to make every one of you feel proud of the name of farmer—proud to be called a farmer's wife—to glory in the fact that you are sons and daughters of farmers—that your father owned the soil upon which you were born, and that you intend to own that upon which his grandchildren shall rise up and call him blessed.

It is a proud calling to be the food manufacturers of a great nation; to know that you are the foundation of that nation; that without you, as a class, the nation could not exist. It would be nothing but a company of shopkeepers and clothmakers, and poor starved ones at that.

Look up, ye sons and daughters of farmers, and exalt yourselves!

Let me hear no sigh for city life, no pining after luxuries which you fancy others have and you have not.

You have the luxury of pure mountain air and the glorious sunshine of summer, and heydey of winter snows and appetizing sleigh rides, worth all and more than all of the luxuries of gaslight, velvet carpets, rustling silks, opera cloaks, late hours, colds, consumption, cholera and death, that closely follow fashion in all the walks of city life, and make it constantly dependent upon the country for a renewal of its diseased and death-wasting population.

Seek to make your own homes more and more beautiful, and you will therewith be more and more contented. Paint your houses—give every window a means of shading off the hot sun or beating storm—make your rooms all light, cool, airy for summer and warm to the utmost degree of comfort for winter—put carpets upon your floors, and do not shut up the best rooms in your house, never to be used. Plant shade trees before your door, and dig up deep and mellow, and make rich with manure, a large spot or a dozen small ones, where your wife and daughters may grow flowers—the very life and soul of a country home; and I firmly express my opinion, that any man who will not give this much to the ornamentation of his home, has no soul—at least none which white men are bound to respect.

If I was a young man in pursuit of a wife, I would shun a flowerless homestead as I would a house of ill-fame. No woman, who did not love flowers, should love me—for I would not love her.

No young man who would not help his mother and sisters to make and tend their flower gardens, need ever come courting around my house. I would not set the dog upon him, for I am not guilty of the folly and wickedness of keeping an animal for which I have no use, and which would deter my neighbor from keeping sheep. But I would allow him to get lost and wander till he starved in the wilderness of flowers with which my house is surrounded.

These are some of the cheap improvements which I urge you all to make, to increase the comfort,

happiness and contentment of your families. I urge you also to cultivate fruit—every kind that will grow in your gardens, so that every member of your family can have it in abundance. Do not consider it lost labor to make and maintain a productive strawberry plantation; one that will furnish your table with a peck of this luscious, health-promoting fruit every day of the season. And so of all other garden fruits—raspberries, blackberries, gooseberries, mulberries, currants—currants that grow as big as cherries—grapes, pears, apples and peaches, if you can grow them. All these should be in profusion upon every farm. It is not labor lost to produce them. It is the way to save doctor's bills. It is the way to build the road to happiness; and that is what we all do, or should live for. If we do not attain it, simply because we neglect the means, it is a question whether we are fit to live. It is no question with me that we are not fit to die.

Now what shall I say as a peroration to this rambling discourse?

Do you expect me to pour out a stream of unmeaning words, complimentary of the high state of agriculture your county has reached? I shall not do it, because I do not believe it. Do you expect me to praise your stock as the finest in the state? That I shall not do until you have improved very far above your present standard.

Do you expect me to compliment you upon your beautiful residences? I will when I find every one of them painted and ornamented, and flower and fruit surrounded.

Do you expect me to compliment you upon your fine appearance as farmers and farmers' sons? I would freely do that; but still I should like to ask your wives and sisters what you have done toward assisting them in their flower gardens, and the ornamentation of the house and its surroundings, and in making everything convenient for "the women folk."

You may be very good looking, but if you have neglected any of these things, you are not handsome. Remember, "handsome is that handsome does."

Before I flatter you much for your good looks here, I should like to see how you look at home.

Is your house gardenless, flowerless, fruitless and in every way untidy and unattractive?

Is there a pig pen, or a privy, or cesspool within smelling distance of your kitchen-door, sending foul odors constantly into the face of your hard toiling wife?

If so, hide your head for shame, or else look me full in the face and swear that you will abate the nuisance before you are a week older.

Promise your wife, as you ride home with her to-night, that as true as you live, and learn how to grow those two blades of grass in the place of the present solitary one, that you will paint the house and furnish blinds for the windows, and make things in general more tidy and convenient. Look me fair in the face, and promise that what I have said for your good shall not be all in vain—that you will think of some of my words and inquire whether you can apply them to your own benefit in the way of improvement.

If you expect me to be very complimentary and flatter you as something near perfection in farming, you have been disappointed. So you have if you expected me to give you any special instruction about your business. That is not my business. I only intended to give a few hints to start your own train of thought.

Ladies! did you expect any special compliments? I am aware that it is fashionable for public speakers—particularly those who make agricultural addresses—to be very complimentary to the ladies.

My dear friends, do I look like a flattering sort of a man? If you think it possible for me to say a sweet thing, I pray you imagine I have said it.

I do say some of you are very good looking, and I have been wondering whether that very pretty girl—she knows which one I mean—loves flowers; of course she does—but whether she can darn stockings and make bread. Whether any of the beautiful samples of butter, cheese, bread, cakes, pies, are the work of her hands. Whether she really delights in the things that make up all the enjoyments of a country home. If so, she is fit for the wife of one of these young farmers, and is altogether lovely, and will, doubtless, live very happy with her chosen companion for life, provided he "fixes up the old house," and makes it convenient and comfortable, summer and winter, with water, woodshed, cooking range, washroom, and washing machine and clotheswringer; for without them, no kitchen is fit to be occupied by any native American woman. Nor should any man ask his wife to make butter or cheese until he has furnished her every possible convenience; nor a new shirt, without a sewing machine.

Nor must any man expect to keep his children from longing after the luxuries of city life, if he deprives them of every luxury at home, particularly the luxury of attending a good district school in a house, the shabbiness of which shall not be a daily temptation to them to commit an act of incendiarism to rid the neighborhood of a nuisance.

I am sure there are such school houses in this county, and I know that there are farmhouses which are a disgrace to this age of prosperity and improved condition that all farmer's families should enjoy.

And now, I appeal to you as farmers, farmers' sons, farmers' wives, and those who I hope will shortly become farmer's wives, with all the conveniences and more than I have indicated; I ask you to take home with you some of the thoughts I have awakened, and apply them to practice.

Sit down around your well-spread table, or around your cheerful evening fireside or reading lamp, and reason together how you can improve your farms, and increase the crops; how you can improve your stock and make it more valuable; how you can improve your home and make it more comfortable; how you can improve your house and its surroundings and make it more attractive, and consequently make your children more contented, and you and all yours happier.

And doing all this, you will give great satisfaction to one who has labored long and zealously in the work of trying to elevate and improve American agriculture, and all those who are engaged in the noble calling. With that view I have addressed you to-day. With what success, it rests with you to say. I only ask you to remember that grass is the leading crop, not only of America, but all the world.

AGRICULTURAL COLLEGES.

THEIR TRUE POSITION AMONG OUR EDUCATIONAL INSTITUTIONS, AND THEIR RELATION TO OUR NATIONAL WELFARE.

BY WILLIAM MUIR.

The only apology that can be presented for intruding this subject on your attention is the deep conviction of its immense importance. It is second to no one question connected with our social condition, and is eminently worthy of the careful consideration of our people as being at once the key to our usefulness as individuals, happiness in our social relations, and our only guaranty for the perpetuation of our republican institutions, and, indeed, of our political existence.

We do not intend entering upon any political discussion whatever. It has been our constant aim to avoid those irritating questions, and we regard the education of our people as a question too high—too vitally important to the welfare of our state, particularly at this juncture—to have any party principles whatever mixed up with its discussion, and we pledge ourselves that where any political allusion is made, it will be in the spirit of calm, philosophical inquiry, and without reference to any political scheme or party whatever.

It is a fact which is self-demonstrating, that the safety and perpetuity of our republican institutions depends on the intelligence and morality of our people.

We ask a question, to call attention to the importance of the subject under consideration: What is it that above all other things has given stability to our government, amid the disintegrating influences that have kept the old continent in confusion for a century, and has led to the world astounding increase of our population and wealth?

It is the millions of unappropriated acres that stretch themselves between the civilization of the white man and the hunting ground of

the savage. Had Britain, France or Germany had these numberless homes in reserve for their expanding and discontented thousands, our country would not to-day be of such colossal proportions and world-wide importance; and had those teeming thousands, annually cast off like swarms of bees from the over-peopled countries of the old world, been concentrated in our large cities, they would have been the elements of weakness and decay, instead of wealth, strength and unbounded expansion.

It is to those millions of unreclaimed, unoccupied acres which have been our safety valve and the citadel of our strength, and to these vast areas and their occupants, that is fixed the eye of hope to the aching heart, the expansive bosom of the philanthrophist, the far-seeing combinations of the statesman, the bounding heart of the patriot; to these vast lands all turn as the theater on the stage of which all can perform their parts without a trammel or a fear; where competition is the stimulus to hopeful action instead of the source of bitterness, jealousy and suffering.

In the careful consideration of the condition, wants and surroundings of the occupants of these broad lands, to the position of the cultivator of the soil we will direct attention as being the place where we shall find the solution of all those questions that arise in connection with the establishment and maintenance of agricultural colleges, and the relation which these should sustain to our existing educational institutions.

At the threshold of this inquiry we may call attention to a difficulty that has arisen in our discussions and legislation. It is one that springs from phraseology. We find the term agriculture sometimes used in a generic and sometimes in a specific sense. At one time it is used to include the culture of the soil in any or all its departments, as horticulture, floriculture, arboriculture, etc.; at other times it is used to refer to the culture of field crops alone; hence arises obscurity, and we are often found combating an idea that, had it been stated by a definite term, would not have called forth a word of opposition. Might not the word terraculture be used in the general sense of embracing all culture of the soil, and then the word agriculture can be specifically applied to the culture of field or grain crops. We are aware that this term was at one time somewhat used to distinguish a merely functional condition, but that is now so little thought of that the term terraculture can be easily adopted to signify the culture of the soil without distinguishing the special object connected with that culture.

We come now to consider the cultivator of the soil and his relation to external objects.

The cultivator of the soil must possess a sufficient amount of brain and muscle. It is of some importance that his muscular system be fully developed. To undertake any class of operations for which the individual is physically unfitted, is entailing constant misery upon him, and tends to give wrong ideas of its duties.

More important than even the amount of muscular power is the power of the mind, and its developement presupposes age. The cultivator of the soil is supposed to enter upon his profession with a sound mind in a sound body. Where does he come from? at best, from the common school.

Our common school system, with all its faults, is a just cause of pride, but being merely rudimentary in its character stops just at the time at which its want is most felt. Its sphere is to put into the possession of the pupil the means by which he can acquire knowledge, viz: reading, writing, arithmetic, etc., but he has to go to the "wide world" to gain his knowledge. Even the high school and university but illy qualifies the man for the duties of active life. In the university the student makes some branch of science his especial study, and graduates to become a theologian, lawyer or physician, as the case may be.

Let us take the agriculturist as he leaves the common school to begin life on the farm. He may learn to cut timber materials, build fences, plow, sow, reap, but all he gains is from the mere force of example, not from reason.

Let us place the man on the farm in his early manly vigor, well furnished with the means supplied by our common schools for acquiring knowledge; he now undertakes to subdue the earth; he avails himself of the aid of the standard and serial agricultural literature. He may have brought with him to the task the aids of an acquaintance with the routine of the farm gained in his infancy, but all his ideas are but traditions at best; his system, if he has any, is mere empericism. He stands on the soil, he employs his hoe, his spade, his plow in it; but what does he know of its nature, its elements of decay or renovation, of the value or application of the waste materials that decay around him, or the stores that underlie his field waiting the call of chemistry or geology to bring forth into activity and usefulness?

He sees the trees of the vast forests that surround his dwelling, knows their names and some of the uses to which they may be applied, but the best time and method to cut timber and clear land, the best timber for the several purposes of the farm, how to encourage, to plant, to manage, to discriminate the useful and the useless, he knows not; he thinks, he reads, he converses with those he supposes to be better acquainted with these subjects, but in the multitude of counselors he is bewildered, and he comes to the unwelcome conclusion that he knows nothing.

He turns to the vegetation he has trodden under his feet since childhood; that is so common, he surely knows it all. But, alas! here the everchanging forms of vegetation force themselves upon his attention. What constitutes a weed? what a crop? whence they come? how long they continue? what causes them to disappear? how to eradicate the one? how best cultivate the other?—in the very multitude of their vulgar names he gets confused, and cannot speak or write understandingly

about them. To economize his labor he must know their character duration, and modes of propagation; and it would astonish the most thoughtful to know how much money is annually lost from not knowing the uses to which many of the so-called weeds can be applied in the arts and sciences and operations of every day life.

He finds difficulties on every hand. Controlled by agencies the more powerful because, in most instances unseen, when he asks for light he is told it is all luck; there he must rest. Night and day, light and darkness, drought and moisture, heat and cold, wind and lightning, summer and winter, all affect him; he seems the very plaything of nature. Insect life, in its multifarious forms, seems to operate on all he has. He finds insects in the forest, the field, the flower, the grainery, in his stock, in his implements, in his fruit, his flour, in earth, in air, in water—all he sees or touches, teems with life, with motion. Are they friends or foes? Come they for good or for evil? What a maze is this insect world! The songsters of the grove, the beasts of the wild, the stock of his pasture, are ever presenting questions in the living book of animal life.

His ax, his wedge, his spade, his saw, his basket, his wagon, his saddle, his harness, his plow, his harrow, all bring him in contact with the mechanic arts.

The reaper, the horse rake, the sulky plow, the horse power, the threshing machine, the steam engine, force the higher mathematical arts on his attention, and tells him he must know the secrets of the forge, the hammer, the turning lathe. And as bone and muscle have to give place to iron and steam; as human labor becomes scarce, and improved machinery must take its place, so must the men that employ those forces be educated. These alone necessitate a higher order of intellect and training in order successfully to conduct the operations of the farm.

Then, how much time is lost by having to go to the "shop" for small repairs that can as well be done on the farm. How much lounging, lazying, gambling and intemperance is caused by the "waiting at the shop on small jobs" that a few tools and a little knowledge would prevent? Again, we have the orchard, the vineyard, the garden, as distinct departments, or accessories. The wind, the cloud, the storm, the heavens as well as the earth, press themselves continually upon him, keeping him in intimate contact with nature in his every movement and operation; constantly face to face with his Creator and his laws.

Who requires such intimacy with the arts and sciences? Who, surrounded in all his operations by influences so subtle, so all-pervading, as the cultivator of the soil? Call such a man a "boor," only a "clodhopper," a mere "farmer." If he even tries to comprehend his responsibilities, he is one of nature's noblest men, gazing face to face with the Omnipotent. Affect to despise him, ye gay, gilded minions of fashion! Disdain his horny hand, his weather-beaten brow, his plain exterior, ye panderers to empty pride and false distinction!

These men are not only the "backbone," but the big, bounding, noble heart that pulsates through every vein, and gives life and health and grandeur to our country.

Let us see him again in his social relations. It is a well known fact that if any one link in the chain of our social life has tended to give us security and happiness, it is "trial by jury."

Our jurors are largely made up of the cultivators of the soil. They are taken there to weigh evidence, hear arguments, render verdicts in cases involving all the affairs of our social existence, embracing every department of science, art and law. Now, what is the opinion of many of our best jurists—men who have spent their lives in studying its intricacies and operations? Some of them have given it as their calm, deliberate opinion, that they would rather place the issue of a case of their own in the hands of any single judge than run the risks of a trial by jury.

Are we prepared to obliterate this dividing line that is so clearly drawn and so broadly distinguishes ancient and modern civilization? Are we prepared to surrender this palladium of our liberties—this guaranty of our individual rights in our social compact? If we are not, we must prepare these men for the discharge of their duties by bringing their minds up to the requirements of their position.

We must meet at this point another fact that will sooner or later have to be met. It is better to broach it now in philosophical calmness than have to treat it in an hour of dangerous necessity. Founded as republican institutions are, upon the "will of the people," we must maintain the moral and intellectual status equal to the requirements of the form of the government, or there will be a dangerous want of balance in the political machinery. Is this not the case today? Let recent and passing events bear witness. One of three steps must be taken, and that without loss of time. We must elevate manhood to its duties, or we must change the right to interference in our political relations from mere manhood to capability, or we must change the form of the government to suit the capacities of the people. Every reflecting mind must see the danger of misdirected power. While the republican form of government is the most exalted of which we can conceive, so it demands the most wide-spread intelligence, the highest morality, the purest patriotism, to give it effect. It opens the door to ignorance, selfishness and corruption to such an extent as to endanger the rights and liberties of all. "The voice of the people is the voice of God" is the much applauded aphorism of an enthusiastic admirer of this best of all systems of government, but when the people cease to be like gods in their intelligence and morality, surely their voice ceases to be God-like.

Again, economy calls for this education, because intelligent labor is a cheaper, more effective and more agreeable servant than that which is ignorant. Is it not the universal complaint that the improvements in labor-saving agricultural implements and machinery are lost for the want of intelligent labor on the farm?

There is still another phase in which we have to view this question. The wisest, the purest, the best of men in all nations have deplored the evils that are mixed up with our social life arising from the false position of the great mass of society, and the consequent loss and misery that is sustained by the individual and by society at large as thus constituted. Many a magnificent intellect and generous soul has labored to mitigate or remove those evils. The panaceas offered has been as varied as the mental endowments of their proposers, or the notoriousness of the evils to be removed, but their success has never been commensurate with the goodness of their intentions or the labor and sacrifice made in behalf of those schemes; but in the industrial education of the people we see the final consummation of all those labors, all those heaven-born aspirations after the elevation of our race.

Every fact of our natural existence and social condition offers convincing proof that our special object in life is to labor. God placed man in his garden to dress and to keep it, and we have to shew a sufficient cause to ourselves, to our fellow men, and to our Creator, why we are not toiling in this garden. When we conceive rightly of this, the true destiny of man, labor will be more honored than it now is, When we surround it with pleasure, clothe it with intelligence, crown it with virtue, it will be more lovely, much more desirable. Men will then select their professions outside of the culture of the soil under the sanction of a special call founded on a special fitness for some other sphere of human labor. Then it will not be as now—adopted without choice, from stern necessity, or a vague idea of the greater honor or prospective emoluments of one profession more than another. Fitness and excellence will be the grand touchstones of our pretensions to any sphere. As labor is at once a law of our nature and a requirement of our social existence, so we should be in a position to comply with those requirements with the fewest obstacles to our satisfactory performance of those duties, and this is the precise position in which we claim agricultural colleges will place us. The young man, leaving the common or high schools, enters upon a course of practical application in all that belongs to the culture of the soil as a science and an art; his muscle as well as his brain trained. The soil, its elements, conditions and relations, vegetation in all its ramifications, drawing, geometry, chemistry, entomology, geology, mineralogy, meteorology, astronomy, the arts, the workshop, the forge, the lathe, the steam engine, the use and structure of implements and machinery, are all the subjects of his every day experience and association, till having spent his three or five years in one of these noble manufactories of mind and muscle, he can take a rational view of true position in society. His teachers, his professors, those who have been his guardians and associates during those years of training and development, who know best his capacities and constitutional predilections, are now a jury that can decide upon the sphere in which he

can move with pleasure, profit and honor to himself and the community.

Is it the soil he loves? Do the broad acres and waving fields of grain fill his mind? He goes there a noble and efficient farmer. Does the orchard, or vineyard, or flower garden, or nursery excite his enthusiasm? They present a fair field for his distinction. Does the forge, or the mine, or mill, or the machine shop find him a sympathetic feeling? There is a place open for him. There the open doors will welcome such devotees. Is he by nature a chemist?—a Litton answers; a physiologist, a Pope; a geologist, a Swallow; an entomologist, a Walsh. Does the tumult of the platform, the dignity of the senate, the acumen of the bar, the grand research of the pulpit find him a votary? We have our classical institutions and noble universities will put a finish upon him, so bright he will shine among the lights of the wide, wide world. Thus every one will find his place; every one will be great in his sphere, because every one will be an enthusiast—because he selected his particular sphere from his love of it, and because of his natural and acquired fitness for it.

There will thus be less of mediocrity and more of genius, which is the foundation of true greatness. We get, without force or constraint, the "right men in the right place;" and every man will feel that he has a direct call from the soil—a call founded in nature and the moral fitness of things. Thus he will be able to realize the grand ideal of the greatest and the best of men in all ages.

Let us look now, for a short time, at the effects of this condition of things on the individual. Where do we find the ripened days of all the great and good of all ages? Where Cincinnatus? At the plow. Where Washington? At Mount Vernon. Where does the toilworn brain of Napoleon seek rest? At Malmaison. Where does the statesman, tired of the intricacies of diplomacy, wearied of the plaudits of the forum, seek rest and quiet in his declining years? Where the philosopher from his studies; the banker from the tinkle of gold and the rustle of paper; the lawyer from the wranglings of the bar, the hunting of precedents, the study of man in his darkest phases of crime?

Where the physician from his acquaintance with humanity in its most loathsome condition, in its hours of deepest agony, or entering upon the confines of the grave? In the home in the country, in the bosom of nature, in the calm association with those objects that thrilled the young heart of his childhood, amidst the beauty of flowers, the melody of birds, the rustle of leaves, the twinkling of the stars. Where can old age and infirmity pass its last hours, amid the purity and innocence of childhood? In that dear country home, in the solitude of the grove, lit up with the smiles of his children's children. Do you ask the proofs? They are found in the books of the assessors and the lists of our agricultural and horticultural societies.

And may we not ask these men—the most experienced, the best

educated of our community?—may we not ask the business men, the retired merchants and manufacturers, who are seeking to create homes for the hours of their retirements: What would you give to-day had you been able to spend some of your earlier years as we have tried to indicate, and as we now plead for? Is not the answer of your soul of souls: No price to-day could pay for it?

Let us see the effects of this condition upon the merely operative classes—those who have not acquired the competency they are struggling for. At present they are exposed to all the vicissitudes incident to the manufacturing condition—liable, from over production or financial difficulty, to be thrown out of employment. In this case they and their families are still consumers of the produce of the soil, and must either suffer privation or draw on the surplus of former employment.

Could these individuals conveniently change their labor from the workshop to the farm, and thus add to the area cultivated and quantities produced, they would change the condition of things entirely. Instead of taking from the surplus of former times and drawing upon the agricultural products, they would increase production in those very channels that most directly met their immediate wants, and create a surplus of produce that would tend to reduce the cost of those products in the future; becoming accumulators, both directly and indirectly, by this easy transfer of their labor in a profitable direction, and thus remove what is ever like a cloud in the home of working classes in the city—the fear of the want of employment.

Thus, the interests of the city operative demands for its amelioration agricultural education.

We appeal for this agricultural education, because legislators, financiers and business men generally would be better able to understand the wants of the cultivators of the soil. How much of the general or state legislation has a beneficial reference to the cultivation of the soil? Let the contradiction, the burdens, the all but utter neglect of their condition and wants, as manifested by their enactments, be the answer.

How are their necessities appreciated by financiers? Let their money facilities, as contrasted between commercial men or manufacturers and the agriculturist, answer. The merchant or manufacturer can, by the use of short-time notes, operate constantly on five times his capital. The agriculturist, with his capital locked up in land, implements, stock and labor, cannot move one-fifth of his capital, and that never in less than from nine to eighteen months. To get accommodation he must secure his note by his property. The financier's own credit is maintained by his keeping up the credit of his traders; but he can make a good thing by closing down on the farmer, whose capital is locked up, and obtain possession of property always rising in value, with increasing population and surrounding improvement, instead of having to look to a stock deteriorating by mere decay or change in fashion, as is the case with the stock of the merchant and manufacturer.

Let us look to the relation of the agriculturist to power over legislation. The merchant, with his small capital and large credit has the minimum of taxation and the maximum of representative influence. The entire capital operated on by the agriculturist is open to taxation, and the payment can be promptly enforced; but the merchant has not real capital to any appreciable extent compared with his operating capital, and his taxation is thus out of proportion with that of the agriculturist, while his stock, from being easily convertible, the taxation cannot be so promptly enforced. The merchant and manufacturer, having many employes and being in a position to favor association, can direct legislation with more effect than can be attained by the agriculturist on account of his isolation. It is an axiom well understood that the ultimate security for national credit, and the ultimate resource for national income by taxation, is the soil.

We urge immediate action on this important subject on account of the present social condition of our state. We have to face the recent changes in our social status. We have had an ignorant and demoralized race relieved from a wonted restraint and set on a political level with us. We have to meet the questions of their new condition. Shall they be returned to a state of thraldom, or shall they be educated up to the duties and responsibilities of their changed condition? To a state of slavery they can never be returned; policy, philanthropy, everything, tells us that is as impossible as undesirable. Shall they, in their present condition, be put in a position so as to counterbalance the political action of the best and wisest among us, and they be made the willing dupes of designing men? The introduction of this element to our political elements has a direct tendency to force a change from a manhood to an educational or a property basis. Let us watch these indications in time. Our only safety is in virtue and intelligence, lest we find our beautiful system of government become a mobocracy instead of a democracy, having the ruling power in the hands of those least qualified for its proper application and the least at stake in its abuse. We shall soon have to meet these questions face to face, and we appeal in the calm, unimpassioned present to do it by the elevation of labor to its proper dignity by education.

We appeal to you with confidence in behalf of industrial education, because the governments of Europe have long found that to educate a people is the best way to make them act correctly. They have taken the initiative in the erection of an industrial aristocracy. The spirit of our government demands an educated industrial democracy. Prince Albert, with profound sagacity, saw he could render his name greater by crowning the industry of Britain with glory than any of his predecessors had done by force of arms through seas of human blood. Albert and Parton, with the hum of the wheel, the rush of the engine, the blast of the forge, the stroke of the hammer, gained a greater name, added more to the greatness of Britain, than all the Georges and Wellingtons by the trumpet's call and the cannon's roar,

the shrieks of the widows and the groans of the dying, in their mistaken thirst after conquest.

Napoleon III., that shrewdest of the great ones of the earth, finds that he can make a world bow to *industrial* France with greater ease and at less cost or risk than could his gigantic uncle with matchless generals and invincible army make men bow to the idea of a *regenerating* France.

We appeal now, because the congress of these United States, the only truly free government, the visible representative and embodiment of the industrial principle—it alone reigns on the throne of industry. Its origin, its foundations, the pillars that support our noble temple of liberty, is industry—the chief corner stone is inscribed with industry. The calm, deliberate judgment of her congress assembled, sanctioned by her chief magistrate, pledged before the wide world, is that *we must have industrial education!* She provides us the model in her agricultural colleges. Shall we have them or shall we not?

The oldest, the most intelligent of our sister states have accepted the grant. With us, with Missouri at the door of all but limitless greatness, shall she say no?

We appeal for this industrial education because economy, true economy, asks us the question: Shall we waste the heritage of our children and their children's children? Shall we cover the land with ignorance, profligacy and hatred of labor? Shall we grind down the community with the punishment of crime when a tithe spent in industrial education will do more for its prevention than the thousands by its punishment? Can we not at least try the industrial college as the counterpart of the penitentiary, the rewarding of industry and the honoring of virtue, as giving completeness to the punishment of crime and hatred of vice.

We appeal for this question with earnestness, because of its vastness. It knows no north, no south, no east, no west, no seaboard, no interior, no creed, no party.

It is in behalf of the cultivators of that soil on which we were all cradled, in which we shall sleep.

Here opens up a path for ambition the noblest, to distinction the straightest, to immortality the surest. Shall we and our children live on in ignorance, amid the blaze of knowledge, or accept the high position to which we are called?

It will be seen clearly that we want nothing that will destroy or impair existing educational institutions, but on the contrary tend to give them greater effect. We lay down cardinal facts—desire to operate on general principles and leave the wants of the community to fill out the details.

We want this to be no classical institution, nor to take the place of one, but to be the stepping stone to such an institution in those cases before indicated.

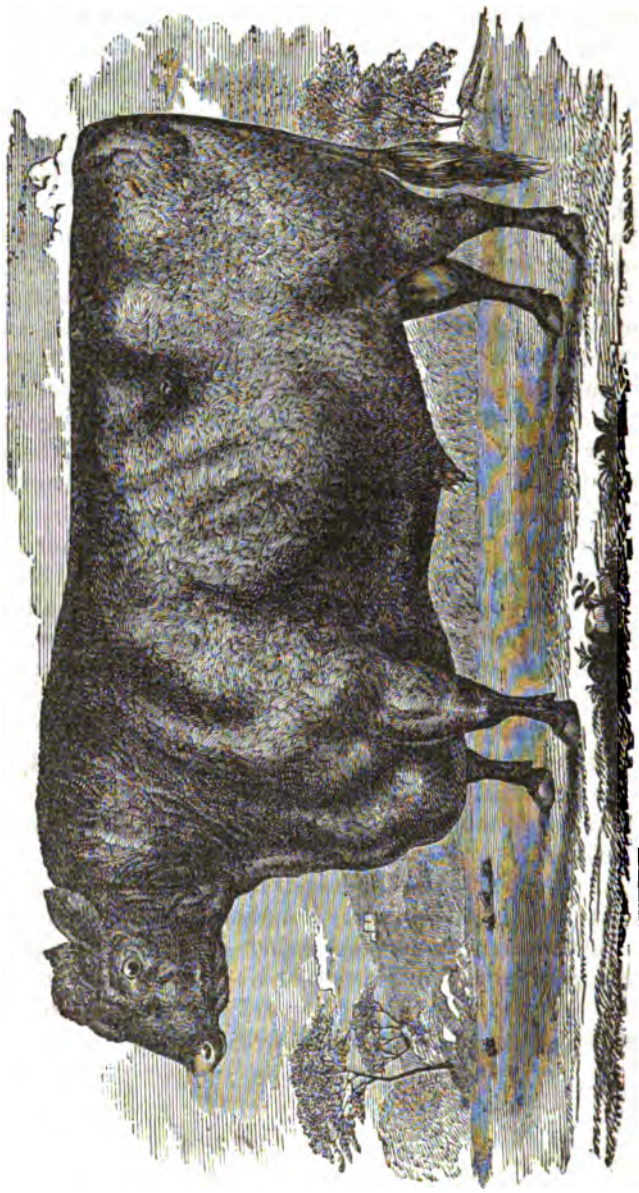
We do not want it a mere school of mines. That is an important

branch to our state, but still a branch; and the student in the industrial college will become familiar with the elements of mineralogy and if there is a special genius for this branch he can be finished at an appropriate institution; nor do we intend it to be a mere manufactory or machine shop? While a general acquaintance with implements and machinery will be communicated to the mind that is formed especially for a machinist in any branch will have abundant opportunity for training and distinction in the far famed establishments in our noble city, where those gigantic works, immense capital, generous enterprise and world wide fame—there they will be gladly received, fully qualified to increase that distinction that has been so nobly won in our central city.

Can we not now, even under present disadvantages, point to long lists of names in every department of industrial life who have achieved greatness and distinction? We have men who can hold audiences in raptures with their eloquence; can pen our best and most instructive literature; that can master the most difficult sciences, and practice the nicest arts, who still can use the ax and the plow, the awl or the hammer, and are not ashamed to have it known that they earn their daily bread. Would we could compile a list of those noble warriors in the industrial conflict, or point out all those pioneers in the path of industrial greatness.

As we honor labor we shall diminish vice; as we honor labor we shall discountenance idleness; as we honor labor we shall discourage speculation; as we honor labor we shall give a fresh stimulus to virtue; as we honor labor we shall open up incentives new, safe and glorious to ambition; as we honor labor we shall crush profligacy and senseless pride; as we honor labor we shall elevate the masses and diffuse comfort, enjoyment and security; as we honor labor we shall exalt justice and pay our court to right instead of might; as we honor labor we shall make it more universal, and so cut short its overstraint and make man more of a thinking, intelligent being, and less of a mere machine.

Shall we, at the sacrifice of thousands of lives and millions of dollars, emancipate the negro from his bondage and let the millions of our white population remain in the bondage of ignorance, with its concommitant dangers, imperil our rights or liberties, yes, even our political existence, because we grudge to spend a few thousand dollars? Verily, we strain at the gnat and swallow the camel.



PRIZE GALLOWAY BULL.

HISTORY AND CHARACTERISTICS OF GALLOWAY CATTLE.*

The breed of cattle known as the Galloway may be said to be indigenous to a section of country known by that name, in the southwest of Scotland, embracing the counties of Kirkcudbright, Wigton, and portions of Dumfries and Ayr. It is a breed of great antiquity, and on account of its various excellencies is sedulouslv preserved in its purity, and is not likely to be displaced by any other in its native district. Of its origin little can be said. It bears considerable resemblance to the breed of the Hebridean islands—commonly called Westhighland breed—the most striking difference being that the Galloways are without horns and the Highlanders are horned. There is, to be sure, considerable difference in size—the Galloways being larger—but this is readily accounted for from the more favorable circumstances under which the latter are reared. The characteristics of the Highlanders are so marked and distinct, that they have been taken as the type of a family of the ox tribe, and some writers consider the Galloway as merely an offshoot from the original stock, modified by the influences of climate and food.

The Galloway breed belongs rather to the mountains than the plains, though the district which they occupy in Scotland may be said to be intermediate between the highlands and the warmer and more fertile lowlands. In hardiness and ability to stand rough weather and rough fare, they are excelled by no cattle, except the Westhighlanders. Their hides are thick, but mellow and elastic; their hair is very thick and much longer in winter than that of the English and most other breeds. Thus they carry a natural protection of which cattle belonging to milder climates are destitute. They are seldom sheltered in Scotland, although the frequent cold storms of winter could scarcely be endured by cattle of ordinary constitutions. Obliged as they often are to sustain themselves through the most inclement season of the year, on coarse and frostbitten herbage, occasionally covered with snow, they are sometimes reduced to a low condition at the beginning of spring; but they improve very rapidly as the new grass comes on, and soon become fit for the butcher.

It may be here remarked that a very erroneous idea prevails in this country in regard to hornless cattle in general. Many people insist on calling every "muley," or no-horned cow or ox, Galloway.

*Abbreviated from the Michigan agricultural report for 1865, by Sanford Howard, Esq., secretary.

They seem ignorant of the fact that there are several breeds of horn-less cattle. In Scotland there are, besides the Galloway, the polled Angus and Aberdeenshire. These, however, have more or less affinity with the Galloway, though the latter is always placed in a separate class at the shows. In England there are the Suffolk and Norfolk polled breeds, and there was formerly the polled Yorkshire, a variety having, in most respects, the chief characteristics of the old Yorkshire shorthorns. In this country polled cattle are frequently seen which, except in the absence of horns, have few or none of the points of either of the varieties above named, though they generally have more resemblance to the Suffolk or polled Yorkshire than to any other. Specimens of these last named breeds were several years imported to this country.

In regard to the question sometimes asked, whether the Galloway should be considered the parent of all the polled varieties except the wild cattle of Cadzow park, we may say that it does not seem probable. At least, there must have been a very great degeneracy in some polled stock, if it ever sprung from the Galloway.

As showing the points and qualities of the Galloway breed, the following British authorities are referred to:

"They are," says Youatt, "straight and broad in the back, and nearly level from the head to the rump. They are round in the ribs, and also between the shoulders and the ribs, and the ribs and the loins. They are broad in the loins, without large projecting hook (hip) bones. In roundness of barrel and fullness of ribs they will compare with any breed, and also in the proportion which the loins bear to the hook bones or protuberances of the ribs. Rev. Mr. Smith, author of the survey of Galloway, says: 'When viewed from above, the body appears to be beautifully rounded like the longitudinal section of a roller.' They are long in the quarters and ribs, and deep in the chest. The slightest inspection will show that there is less space between the hip and hook bones and the ribs than in most other breeds—a consideration of much importance, for the advantage of length of carcass consists in the animal being well ribbed home, or as little space as possible lost in the flank.

"The Galloway is short in the leg, and moderately fine in the shank bones—the happy medium seems to be preserved in the leg, which secures hardihood and a disposition to fatten. With the same cleanness and shortness of shank, there is no breed so large and muscular above the knee, while there is more room for the deep, broad, and capacious chest. He is clean, not fine and slender, but well proportioned in the neck and chops; a thin and delicate neck would not correspond with the broad shoulders, deep chest, and close, compact form of the breed.

"The Galloway is covered with a loose, mellow skin of medium thickness, and which is covered with long, soft, silky hair. Even on the moorland, where the cattle, during the greater part of the year,

are fed on the scantiest fare, it is remarkable how little their hides indicate the privations they endure."

In regard to the purity and fixed character of the breed, the same writer observes: "There is, perhaps, no breed of cattle which can more truly be said to be indigenous to the country, and incapable of improvement by any foreign cross, than the Galloway."

A similar remark is made by Professor Low. "The breed of Galloway," he says, "is peculiarly confirmed in its character, and thoroughly adapted to the condition of the country.

It is easy to understand, bearing in view the characteristics of the Galloways, as above described, why all attempts to improve the breed by crossing it with others have proved unsuccessful. Allusion has already been made, in a quotation from Culley, to a cross tried with Bakewell's variety of the long-horns, and it appears that at a later day similar trials were made with the short-horns.

The flesh of the Galloways is of very fine quality, and commands a higher price per pound in the markets of England and Scotland than that of any other breed, except Westhighlanders and the cattle of the Shetland islands. From the cylindrical form of the carcass, the "Galloway rib" is well known in the London market. Culley, to whom reference has previously been made, remarks of the Galloways: "Few or no cattle sell so high in Smithfield (London), market, being such nice cutters up, and laying the fat on the most valuable parts; and this is a great excellence in all feeding cattle. It is no uncommon thing in this refined market, to see one of these bullocks outsell a coarse Lincolnshire ox, though the latter may be the heaviest by several stones weight. I was told by a Lincolnshire grazier that a Lincolnshire bullock and a Scotch bullock, sent from the same village at the same time, were sold for exactly the same money, though the Scot was only half the other's weight."

The trade in stock from the district of Galloway has been very extensive for more than a hundred and fifty years, large numbers of cattle being annually sent to the English markets. Professor Low says: "It is computed that upwards of 20,000 head are annually exported from the district. Their average dead weight at three years old may be reckoned at 45 stones of 14 pounds to the stone (630 pounds); those sent to London weigh from 55 to 60 stones (770 to 840 pounds)." These weights are for the four quarters, or meat only.

It will be inferred from what has been said, that the leading excellencies of the Galloways consist in their superior value as fattening stock. The cows are not remarkable for the quantity of their milk, but it is very rich, and affords a comparatively large proportion of butter of the finest quality. Youatt says a cow may average "six or eight quarts per day during the five summer months, after feeding her calf," and that during the next four months she may give half that quantity, running dry the remaining three months of the year. According to this, we may assume that the average for the first five

months would be seven quarts per day, and for the next four months three and a half quarts per day; which would give, as an annual product, one thousand four hundred and seventy quarts, besides supporting the calf.

From some experiments made on the milk of cows of different breeds on the "crown estate," at King William's Town, Ireland, a summary of which was published in the Journal of the Royal Agricultural Society of England, vol. iv, it appears that an average of nine and a half quarts of the milk of the Galloways produced a pound of butter. This would give, as the average annual product from the quantity of milk above mentioned, one hundred and fifty-four pounds of butter, an amount which is believed to be far greater than the average product of cows in this country, and exceeded only by well-selected and well-kept herds. But this average product for the Galloways is for the milk they yield besides supporting the calf; and to give some idea of the quantity which is used for this purpose, it is proper to refer to accounts which describe the manner of raising calves in Galloway. Mr. Youatt says:

"The calves are reared in a manner peculiar to Galloway. From the time they are dropped they are permitted to suck the mother, more or less, as long as she gives milk. During the first four or five months they are allowed, morning and evening, a liberal supply; generally more than half of the milk of the cow. The dairy-maid takes the teats on one side, while the calf draws the milk at the same time, and exclusively, from the other side. When the calf begins to graze a little, the milk is abridged by allowing the calf to suck only a short time, and he is turned upon the best grass on the farm. In winter he is uniformly housed during the night, and fed upon hay, with a few turnips and potatoes; for the breeder knows that if he is neglected or stinted in his food during the first fifteen months, he does not obtain his natural size, nor does he feed so well afterward."

When it is recollected that half the milk of the Galloway cow in her native district, for four or five months after calving, is taken for the support of the calf, the quantity she must afford during the year is far from being small, and a fair estimate for the quantity of butter which all her milk would yield in the year, could not be less than two hundred pounds—a quantity only equaled by our best dairies with the best management. It should be borne in mind, too, that this product refers to what the stock does in a rough and not fertile country. Upon a fair view of the case, therefore, the conclusion must be adopted that no breed fitted for such a situation would be likely to do better there than the Galloways, even for dairy purposes.

Mr. Snell, of Edmonton, C. W., to whom allusion has before been made as a breeder of Galloways, keeps both this breed and the short-horns—about thirty head of each. His Galloway and short-horn cows run together, and he states that the quantity of milk given by the two breeds is about equal, but that the milk of the Galloways is much richer.

Considering the characteristics and the long established reputation of the Galloway cattle, it seems singular that they were not long since introduced into the United States. There can be little doubt of their adaptation to the northern portion of the country. Our Canadian neighbors, many of whom were emigrants from Scotland, evinced a better appreciation of the value of this breed, and, some twelve years since, introduced specimens into the Upper Province. Their adaptation to the country, and their obvious merits, have caused them to increase and spread rapidly. At the late provincial show, at London, C. W., there were no less than seventy entries for Galloways, and ten entries for the polled Angus.

Persons acquainted with the Galloways have been of the opinion that they would be a highly useful stock for portions of our country. The late Felix Renick, Esq., a gentleman distinguished for his judgment in regard to cattle, and who was the agent for the purchase of short-horns for the Ohio stock importing company, 1836, more than once stated to the writer of this article, that had his object been to procure the best cattle for the northern states, he would have taken the Galloways and Westhighlanders. I think no good judge, who has had the opportunity of studying these cattle in Scotland, can fail to see their adaptability to our wants.

B. P. Johson, Esq., the well known secretary of the New York state agricultural society, who has had ample opportunities for examining the stock of Britain, speaking, several years since, of the Galloways in reference to their introduction into New York, says: "There is no doubt of their adaptation to many portions of this state, as well as to the northern states generally. Their aptness to fatten is such that they would, at comparatively little expense, be fitted for market, and the superiority of their beef is well understood by every one acquainted with the London market; and if introduced here they would doubtless become equally popular. I was asked by a distinguished breeder in this state, which among the various breeds of cattle in Great Britain I considered best adapted to the northern states. I answered that if it was left to me to select, I would have no hesitation in choosing the Galloways and Westhighlanders."*

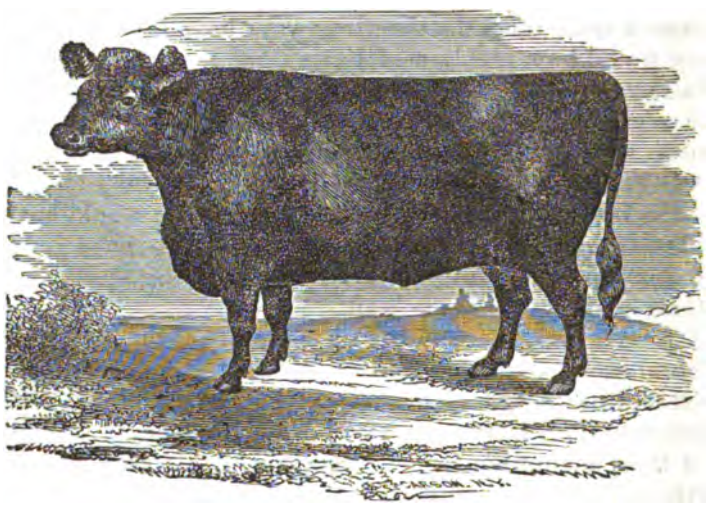
Yet it is only within a short time that any of the pure Galloway breed have been introduced into the United States. Hon. Ezra Cornell, of Ithaca, New York, having seen specimens of the breed at the combined show of the English royal and Scottish highland agricultural society, at Battersea, near London, in 1862, was so much pleased with them, that he has since imported some. Under date of November 30, last, he writes: "The Galloways which I saw at Battersea, were most beautiful animals, and carried all the points of thrifty, good feeders. I have a bull, two cows and a heifer calf—all fine animals."

The Michigan state agricultural college purchased of Mr. Snell, in September last, the young Galloway bull "Victor," to which allusion

*Transactions New York state agricultural society, for 1846, page 292.

has before been made, and a fine two-year old heifer. They are doing well at the college farm. If, on being subjected to a fair trial, they prove as well as may reasonably be expected, it is to be hoped that the introduction of these specimens will lead to the establishment of the breed in this state.

The figure of a Galloway bull, which fronts this article, is a portrait of one owned by the Duke of Buccleugh, which obtained the first prize of his class at the show of the highland agricultural society in 1845. The animal was four years old. The original engraving appeared in the (London) Farmers' Magazine.



As further illustrating the points of the breed, the figure of a heifer is given, taken from the complete Grazier. It shows what would be considered in Scotland a good (not extraordinary) specimen of the Galloway breed, in such condition as the stock usually is after a fair run at grass. The fine symmetry of the animal, especially the roundness of the carcass and the evenness with which the flesh is laid on, together with an appearance of great constitutional vigor, is well shown in the cut.

ORCHARDS.

BY NORMAN J. COLMAN.

An orchard of fruit trees is an indispensable appendage to every farm. No family ought to live without fruit. There is no cheaper diet than fruit. There is no healthier diet than fruit. Neither is there

any that is a greater luxury. All of these propositions are so obvious to every enlightened mind that they need no demonstration. To plant an orchard, therefore, so as to obtain from it the highest success, and the greatest profit, should be a matter of serious consideration to every farmer. To those having the subject under consideration, we will throw out a few hints.

The selection of the best site the farm affords is the first important step. It is more convenient to have the orchard contiguous to the house, and if it has been built where it ought generally to be, viz., on the highest elevation the farm affords, so as to secure the best health and the finest scenery, then planting an orchard close to the dwelling is proper. But if the house is built in a valley or on low land, so as to be near a spring, as is often the case, and the farm affords greater elevations, then those should be selected.

The very highest land that will admit of cultivation on the farm should be selected for the orchard site. The reason for this is that the cold air will settle in the valleys, being heavier than the warm air. No one who has ever ridden much in the country has failed to notice that, when he descends from a hill into a valley, he meets with a cold stratum of air. As he passes through the valley and ascends the hill, he meets with the warm air again. This we noticed when a boy. In a room, the cool air will be found at the floor. As the air becomes heated it rises. Therefore the highest points are the warmest. Now when fruit trees are in blossom in springtime, this is a matter of great importance. The cold air will settle in the valleys, and the frost will kill the blossoms, and there will be no fruit. On the hill tops, where the temperature was higher, there was no frost, and the fruit is safe. Skillful orchardists take advantage of their knowledge of this fact, plant on high ground, have a crop every year, or nearly so, and reap great profits when the fruit on the low lands is destroyed. There are some other well known facts of which they also frequently take advantage. They plant orchards in close proximity to lakes, rivers, etc. Large bodies of water have a great influence upon the temperature of the surrounding land. The water retains more or less heat. This it gives off slowly but surely, as all matter tends to an equilibrium in temperature. The atmosphere receives the benefit of this escape of heat, and it is sometimes sufficient to save a crop of fruit. But there is likewise another benefit derived by orchards planted near large bodies of water. Water is constantly evaporating—the air is taking it up, it is softened, and the temperature increased thereby. On these accounts, and still others that might be named, the bluffs along our rivers and lakes are peculiarly well adapted for orchards.

Mere elevation of land is not enough. There must be valleys, chasms, into which the cool air can sink. If the whole country is high, the temperature will remain the same. Elevation does not increase temperature, but lowers it, of itself. Elevation is only important on account of the adjacent valleys and low lands into which

the cold air can settle. The warm air being lighter rides on the cool air and embraces the hill tops. We have noticed this matter perhaps more lengthily than we should have done. But here it is that we generally commit the first great blunder. If we select a site unadapted to fruit, we may spend ever so much money, skill, patience and time, and we can never make it thoroughly successful. Had this point been as deeply impressed upon our mind at the outset of life as it now is, it would have been to us of almost incalculable advantage. A really good orchard site is a fortune to almost any one if improved. They are scarcer articles than most people imagine.

To the inclination of the land we do not attach much importance. So it is high and has the other requisites, any inclination will do. We would prefer the summit of a hill first; next a northern inclination, then an eastern one; next a southern one, and would take the western one last, though we have seen fine orchards on western exposures, and indeed, upon all. The northern inclination has generally the best soil, and is less subject to be affected by drought and our hot sun, and is nearly as early as the southern. Still, as before stated, any inclination will do, if the site has the other important requisites.

The preparation of the soil for trees is a matter of great importance. We are a fast people, but make haste slowly in a great many ways, and in none more slowly than in planting in ground illy prepared. Better wait one, two or three years longer, and get the land in the best possible condition, than to plant in soil not properly prepared. The trees will make a sickly, feeble growth; they will be a great while in coming into bearing and produce poor crops. Trees planted two or three years later in soil deeply and thoroughly plowed and subsoiled, will overtake them before they get into bearing, and produce quadruple the amount of fruit. But Young America can't wait. The trees must go in now or never, and the result, no matter what the condition of the land, is as has been described.

In planting market orchards, and particularly of peach trees, most beginners make a mistake by not making a proper proportion as to the time of ripening. Some want nearly all early sorts—think them the most profitable—others have found the latest varieties most profitable, and some plant the best varieties, regardless of time of ripening.

The proper way is to have a certain number of trees ripening weekly throughout the season. The peach season lasts ten weeks, from the very earliest to the very latest. Now, if a man wants to plant five thousand peach trees, he should have five hundred trees ripening weekly throughout the season. Then he can keep the same number of hands constantly at work, the same number of wagons hauling to the depot, the same number of boxes or baskets constantly in use, and the same amount of room in the cars occupied. Everything thus works like clock work. One has not too many hands to-day and too few to-morrow. The market is not glutted or empty—but everything works healthfully. Some of our peach orchardists the past sea-

son had so many ripening at a time that they could not market them, and then for a week or two did not have a ripe peach. Every one must see the necessity of exercising the greatest care in selecting the varieties to plant, not only of the peach, but of every variety of fruit.

It is of the highest importance to obtain young, thrifty trees, of medium size, for planting. Too many are anxious to obtain large trees. They think they will come into bearing sooner. They may produce a few specimens earlier, as by cutting off the roots and transplanting, their growth is so much checked that fruit buds are produced, and a few poor specimens may be ripened. But the young, medium sized tree will speedily overtake it, and bear ten times the fruit within ten years from the time both are planted. All experienced fruit growers want trees of medium growth; all inexperienced want them very large. But they soon learn to want smaller trees. The selection of varieties is a matter of the highest importance. What is more annoying than to buy trees, carefully plant them, and watch over them, and care for them as one would for his own children, and find, when they come into bearing, that they are worthless—unadapted to his soil and climate? Nothing is more disheartening to the fruit grower. And yet millions of trees are being annually sold in the west, that have been raised in eastern nurseries, and succeed admirably in an eastern climate, that are totally unadapted to our climate. He who intends to plant trees, should ascertain what varieties do well in the particular locality in which he intends to plant. He can then make no mistake. He learns from others' experience, and has not got to go through the bitter and dear school himself. It costs no more trouble, or care, or money, to raise a tree that you are sure will produce good fruit, than it does to raise one which is only an eye sore.

After the trees are planted, the ground should be worked for four or five years, in hoed crops, or the ground should be kept well pulverized by cultivation. It would be better to cultivate the trees as the crop, and not abstract the virtues from the soil by producing crops which are to be taken off. The better the soil the better the trees, generally; though the soil may be too rich, and the trees may be forced along too rapidly, though there is little danger in this respect.

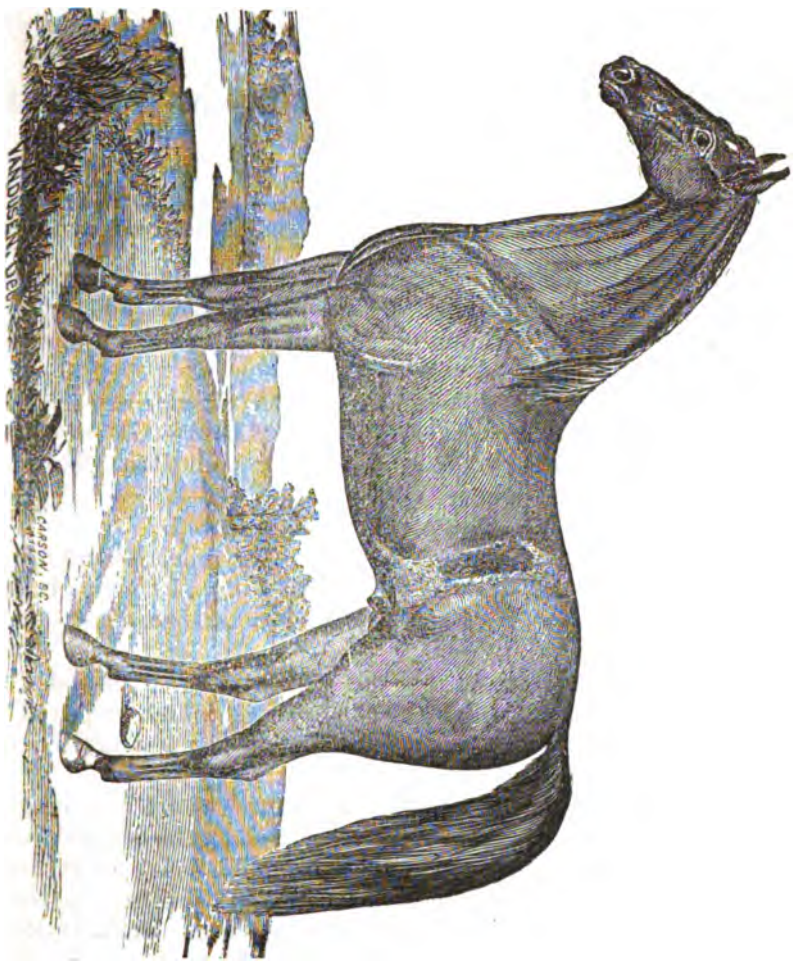
After the trees have got well established, and have come into a bearing state, the soil should be sowed to clover, or the grasses. We know that we touch upon tender ground here, but much observation and experience have induced us to form these opinions.

We know that many think an orchard should never be put in grass; but the finest orchards we have ever seen were in grass or clover. In this climate it is more particularly necessary than in a more northern one, on account of our long, dry, hot summers. The grass is a mulch. It keeps the hot summer winds from embracing the soil, and drinking up its moisture. The temperature of the soil is kept more equable. The fruit does not suffer in consequence of the drought, as the roots are kept comparatively moist and cool by the mulching the grass affords.

The trees make a regular healthy growth, and bear, regularly, smooth, good fruit. If the soil is rich in the orchard, crops of hay may be taken from it, but if poor, it should be cut and spread on the ground to enrich it. If it is poor, it should not be further robbed; and manure should be spread on the surface. It not only enriches, but it is a mulch as well—and, in this climate, mulching means a great deal, and accomplishes a great deal. Its importance is not half appreciated. It is almost the sine qua non to successful fruit culture of all kinds.

The young trees must be carefully watched. The borers in particular must be kept under. They are very destructive to apple and peach trees, and the knife and wire must be in constant use, or great loss of trees will ensue.

Frequent washing of the trees with soapsuds, and other solutions that are recommended, is very valuable. It keeps the bark smooth and thrifty—destroys the eggs of insects, and the potash, etc., contained in the solutions, aids in fertilizing the soil.



TROTTING STALLION ABDALLAH—Owned by N. J. Colman, St. Louis.

Sired by R. Aitchison Alexander's celebrated trotting stallion, Abdallah, which was stolen from his farm in Kentucky, by the guerrillas, and in an encounter for his rescue was killed. Valued at $20,000. He was sired by Rysdick's Hambletonian, who stands for mares at $500 each. Mr. Rysdick has refused $35,000 for him.

The dam of Abdallah, Jr., is the thoroughbred mare, Kitty Fisher, by Chorister; he, by imported Contract. The grand dam of Abdallah, Jr., is the invincible old Bertrand, formerly owned and run by John R. Sparr, of South Carolina.

Abdallah, Jr., was foaled in the spring of 1861; color, blood bay, with black points, fifteen hands two inches high, possessing remarkable muscle and power. He inherits the natural trotting action of the Messenger breed in a high degree; could show a 2.50 gait without any training; has fine knee action, coupled with a long slashing reach from behind.

It has been fully demonstrated, by repeated experiment, that it is no more difficult to breed fast trotters than it is to breed fast runners, and high-bred trotting horses always command high prices.

PROCEEDINGS OF THE STATE BOARD OF AGRICULTURE.

ROOMS OF THE BOARD OF AGRICULTURE,
ST. LOUIS, March 28, 1866.

At a called meeting of the board there were present Messrs. Wm. T. Essex, L. D. Morse and Henry T. Mudd, of St. Louis county, Hon. Francis Kellerman, of Washington county, and Barnabas Smith, of Crawford county.

Absent.—Messrs. George R. Buckner, of St. Charles county, Hon. Gert. Gœbel, of Franklin county, Hon. J. W. Harris, of Boone county, Hon. Frederick Muench, of Warren county, and Hon. Charles A. Newcomb, of Jefferson county.

The journal of the last meeting read and approved.

Wm. T. Essex, treasurer elect, submitted his official bond for the sum of ten thousand dollars, with George H. Gill and Thomas L. Mills as securities, which was read and approved by the board and ordered to be filed.

Mr. President Mudd stated that the legislature had passed a bill creating the office of commissioner of statistics, which required the board of agriculture to recommend to the governor a suitable person to be appointed as said commissioner.

Mr. Smith submitted the following resolution, which was adopted:

Resolved, That in pursuance to an act passed by the general assembly of this state, creating the office of commissioner of statistics, making it incumbent on this board to recommend a suitable person to fill said office, we hereby recommend to the governor Dr. L. D. Morse, the corresponding secretary of this board, as a suitable person to be appointed commissioner of statistics.

The board then proceeded to fix the salaries of the corresponding secretary and recording secretary.

Mr. Kellerman submitted the following resolutions, which were adopted:

Resolved, That the salary of the corresponding secretary be and the same is hereby fixed at two thousand dollars per annum, from the first day of February of the current year, and that of the recording secretary at one hundred and fifty dollars per annum.

Resolved, That the sum of one thousand dollars be allowed the corresponding secretary for services rendered previous to the first day of February last, and seventy-five dollars for similar services to the recording secretary to same date

Resolved, That the salaries aforesaid be paid monthly, on the first day of each month.

On motion, the board then adjourned to meet again on to-morrow at 2 o'clock P. M.

JOHN H. TICE,
Recording Secretary.

ST. LOUIS, March 29, 1866.

The board met pursuant to adjournment; present, same as on yesterday.

Mr. President Mudd stated that he had received a letter from the secretary of state informing him that he was unable to furnish copies of the laws referred to, and asked for in time for to-day's session; but that they would be furnished as soon as possible.

The following letter was read and ordered to be filed:

ST. LOUIS, March 29, 1866.

To the honorable members of the state board of agriculture:

GENTLEMEN: Believing the state board of agriculture to be composed of those who labor to advance the interest of the state, and as grape growing is one of the important branches of agriculture, so it is essential to success, and to realize a quick return of money, to plant good stock. I therefore send to the board for distribution among the members a few samples of yearly cuttings, and also layers of the same age, of that king of grapes, the Concord, as specimens of vines such only as ought to be planted.

Yours, very truly,

J. M. JORDAN.

On motion, the thanks of the board were returned to Mr. Jordan for his acceptable attention in presenting vines that must be pronounced the best of their class.

Dr. Morse submitted the following resolutions, which were adopted:

Resolved, That this board will offer to pay the following premiums:

For the best approved essay on the preparation and management of a stock farm in Missouri, based on the experience of the author, twenty dollars.

For the same, on dairy farm, twenty dollars.

For the same, on wool growing in Missouri, including the preparation and marketing of the wool, twenty dollars.

For the same, on manufacturing in Missouri, facilities and necessity of manufacturing establishments, and their relations to the agriculture and commerce of the state, twenty dollars.

Be it further resolved, That the above essays must be delivered to the corresponding secretary on or before the first day of December, 1866.

The subject of procuring a proper and suitable room for an office for the board being taken up, on motion of Dr. Morse the subject was referred to the treasurer and recording secretary, with instructions to contract for a suitable room or rooms, if such can be found.

On motion, the board then adjourned.

JOHN H. TICE, *Recording Secretary.*

ROOMS OF BOARD OF AGRICULTURE,
ST. LOUIS, Wednesday, December 5, 1866.

This being the day fixed by law for holding the annual meeting of the Missouri state board of agriculture, there were present William T. Essex, L. D. Morse and Henry T. Mudd, president, all from St. Louis county, of the incorporated members, and Hon. Alva Culver, president of the Ste. Genevieve agricultural and mechanical association, and O. A. A. Gardiner, delegate from Audrain county agricultural society, of the ex-officio members. There not being a quorum present, the board adjourned to 2 o'clock P. M.

JOHN H. TICE, *Recording Secretary.*

WEDNESDAY, 2 o'clock, December 5, 1866.

The board met pursuant to adjournment.

Present same as in the morning—no quorum appearing.

The board adjourned to Wednesday, January 9, 1867, at 2 o'clock P. M.

JOHN H. TICE, *Recording Secretary.*

ST. LOUIS, January 9, 1867.

This being the adjourned meeting of the annual meeting, there were present Messrs. William T. Essex, L. D. Morse and Henry T. Mudd, of St. Louis county, and R. Smith, of Crawford county, incorporated members; and D. W. Bryant, president of the Jefferson county

agricultural society; O. A. A. Gardiner, of the Audrain county agricultural and mechanical association; George Husmann, delegate of the Gasconade agricultural society; and Prof. G. C. Swallow, delegate of the Boone county agricultural and mechanical association, ex-officio members.

Absent—George R. Buckher, of St. Charles county; Gert. Gœbel, of Franklin county; J. W. Harris, of Boone county; Francis Kellerman, of Washington county; Frederick Muench, of Warren county; and Charles A. Newcomb, of Jefferson county, incorporated members.

Prof. Swallow stated that certain papers and documents were handed him by the secretary of the Boone county agricultural and mechanical association, with the statement that his credentials as a delegate from that association were among the papers, but upon opening the package his credentials were not found. He, therefore, submitted the fact to the action of the meeting.

Dr. Morse stated that he had official information that Prof. Swallow was appointed such delegate. He, therefore, would submit the following resolution:

Resolved, That since the credentials of Prof. Swallow have been mislaid, but the board having official information of his appointment, he is hereby admitted as an ex-officio member of this board, as contemplated by law.

Dr. Morse, the corresponding secretary, being called upon, stated that the annual state report for 1866 was nearly ready for the press, but as it was too lengthly to be read before this meeting, he would give a synopsis of the subjects treated of in it.

The general character and peculiarity of the season and crops, pests, etc., including the invasion of the western part of the state by locusts, or so-called grasshoppers; the Texas fever in cattle, etc., fruit growing, tobacco growing, flax and hemp, hop culture, broom corn, wool growing; manufacturing, improved implements, cattle, hogs, importance of pasturage, fall and subsoil plowing, the agricultural college, the St. Louis fair, physical geography of Missouri, trees, shrubs and vines of Missouri, county reports, addresses, proceedings of the state horticultural society, etc. He stated that he had been furnished with the report of the late fair held by the agricultural and mechanical association at St. Louis, a somewhat lengthy but interesting document, and should publish it in the annual state report, if advised by the board.

On motion, authority to publish the same in the annual report was granted.

Dr. Morse stated that he had received two essays for the premiums offered at the meeting of the board on the 20th of March last, and suggested that the same be referred to a committee to award the premiums, if deemed worthy.

On motion, O. A. A. Gardiner, Mr. Smith and Prof. Swallow were appointed a committee, to which said essays were referred.

William T. Essex, treasurer, submitted the following account current of receipts and expenditures, from which it appears that he received from the state treasurer $4500, and that he had paid warrants drawn upon him by the executive committee to the amount of $3768 09, leaving balance in treasury of $731 91.

TREASURER'S REPORT.

William T. Essex, in account with the state board of agriculture.

April	5, 1866	To cash account from state treasurer	$4,500 00
	6	By cash paid L. D. Morse, as per voucher No. 1	1,333 32
	9	J. H. Tice, as per voucher No. 2	100 00
	14	L. D. Morse, as per voucher No. 3	71 55
		James Cramer, as per voucher No. 4	4 50
	20	B. Smith, as per voucher No. 5	66 90
		George Parker, as per voucher No. 6	6 00
	24	R. & T. A. Ennis, as per voucher No. 7	10 00
		F. Kellerman, as per voucher No. 8	50 00
May	3	J. H. Tice, as per voucher No. 9	12 50
		L. D. Morse, as per voucher No 10	147 70
		Levering & Webster, as per voucher No. 11	25 00
June	4	L. D. Morse, as per voucher No. 12	348 23
	6	John H. Tice, as per voucher No. 13	12 50
		John H. Tice, as per voucher No. 14	15 25
	29	Levering & Webster, as per voucher No. 15	75 00
July	1	L. D. Morse, as per voucher No. 16	166 66
		John H. Tice, as per voucher No. 17	12 50
Aug.	1	L. D. Morse, as per voucher No. 18	176 16
		J. H. Tice, as per voucher No. 19	12 50
Sept.	1	L. D. Morse, as per voucher No. 20	176 66
		J. H. Tice, as per voucher No. 21	12 50
		P. Kennedy, as per voucher No. 22	35 00
Oct.	1	L. D. Morse, as per voucher No. 23	167 56
		J. H. Tice, as per voucher No. 24	12 50
	15	Levering & Webster, as per voucher No. 25	75 00
Nov.	1	L. D. Morse, as per voucher No. 26	170 56
		J. H. Tice, as per voucher No. 27	12 50
Dec.	1	L. D. Morse, as per voucher No. 28	217 83
		J. H Tice, as per voucher No. 29	12 50
Jan.	1, 1867	John H. Tice, as per voucher No. 30	12 50
		L. D. Morse, as per voucher No. 31	166 66
	8	R. P. Studley & Co., as per voucher No. 32	50 05
		Total	$3,768 09
Jan.	9, 1867	To balance due this day	731 91
			$4,500 00

Mr. Tice, recording secretary, submitted the following report

OF THE PROCEEDINGS OF THE EXECUTIVE COMMITTEE:

April 6, 1866.	Audited account of L. D. Morse, for salary to February 1, 1866, for		$1000 00
	Audited account of same, for two months' salary to April 1		333 32
9	Audited account of J. H. Tice, for salary to February 1		75 00
	Audited account of same, for two months' salary to 1st inst		25 00
14	Audited account of L. D. Morse, for personal expenses at Jefferson City; engraving wood cuts for annual report, express charges, postage, etc		71 55
	Audited account of James Cramer, for cleaning office rooms		4 50
20	Audited account of B. Smith, for personal expenses attending to meetings of the board		66 90
	Audited account of George Parker, for whitening office rooms		6 00
24	Audited account for R. & T. A. Ennis, for record of the board		10 00
	Audited account of personal expenses of F. Kellerman, in attending meetings		50 00
May 3, 1866	Audited account of J. H. Tice, for one month's salary		12 50
	Audited account of L. D. Morse, as follows:—		
	For amount paid S. B. Flint, for office desk, bookcase and chairs	$103 50	
	For amount paid Foster & Cooper, for eight boxes and packing books	25 40	
	For amount paid Pacific railroad, for freight and drayage	17 00	
	For amount paid express, for charges on package	1 80	
			147 70
	Audited account of Levering & Webster, for one month's office rent		25 00
June 4, 1866	Audited account of L. D. Morse, as follows:—		
	For two months' salary to 1st inst	$333 33	
	For postage, drayage, express charges, etc	14 90	
			348 23
5	Audited account of J. H. Tice, for salary to 1st inst		12 50
	Audited account of same, for expenses incurred attending meetings of the board		15 25
29	Audited account of Levering & Webster, for three months' rent, to August 5		75 00
July 1, 1866	Audited account of L. D. Morse, for one month's salary to date		166 66
	Audited account of J. H. Tice, for one month's salary to date		12 50
August 1, 1866	Audited account of L. D. Morse, as follows:—		
	For one month's salary to date	$166 66	
	For boxes, express charges and postage	9 50	
			176 16
	Audited account of J. H. Tice, for one month's salary to date		12 50
Sept. 1, 1866	Audited account of L. D. Morse, as follows:—		
	For one month's salary to date	$166 66	
	For express charges, postage and broom	10 00	
			176 66
	Audited account of John H. Tice, for one month's salary to date		12 50
	Audited account of Peter Kennedy, for official seal of board		35 00
October 1, 1866	Audited account of L. D. Morse, as follows:—		
	For one month's salary to date	$166 66	
	For express charges	90	
			167 56
	Audited account of J. H. Tice, for one month's salary to date		12 50
5	Audited account of Levering & Webster, for three months' office rent to November 5		75 00
Nov. 1, 1866	Audited account of L. D. Morse, as follows:—		
	For one month's salary to date	$166 66	
	For postage stamps, $3; express 90c	3 90	
			170 56
	Audited account of J. H. Tice, for one month's salary to date		12 50

REPORT OF EXECUTIVE COMMITTEE—CONTINUED.

Dec. 1, 1866..	Audited account of L. D. Morse, as follows:—		
	For one month's salary to date	$166 66	
	For cuts for report and charges	11 07	
	For Buck & Wright, for office stove	26 10	
	For express charges, postage, etc	6 50	
	For wood for office	7 50	
			$217 83
	Audited account of John H. Tice, for one month's salary to date		12 50
31.....	Audited account of L. D. Morse, for one month's salary to date inclusive		166 66
	Audited account of J. H. Tice, for one month's salary to date inclusive		12 50
January 4, 1867	Audited account of R. P. Studley & Co., bill for stationery for office and printing		50 05
	Amount of accounts audited		$3768 09

On motion, the treasurer's report was referred to a committee of Messrs. Swallow, Bryant and Smith, for examination.

Mr. Essex stated that in order to secure proper legislation, he thought it necessary that the board should appoint a committee to proceed to Jefferson City to represent to the legislature the great interest confided to this board. He had no doubt the members of the legislature were favorably disposed to do all that lay in their power to promote the agricultural interest of the state, but it was not to be expected that they understood all the details necessary to legislate efficiently, and enable the board successfully to accomplish the work to which it had devoted its energies. He, therefore, submitted the following resolution, which was adopted:

Resolved, That the president and corresponding secretary of this board be constituted a committee to proceed to Jefferson City, to lay before the legislature such matters relating to agriculture, for its action, as may be necessary to the efficiency of this board in promoting the agricultural interest of the state.

On motion of Dr. Morse, the board then proceeded to fill the vacancies in the board of members whose term of service has expired by limitation, namely: that of George R. Buckner, of St. Charles county; Wm. T. Essex, of St. Louis county; Dr. L. D. Morse, of St. Louis county; Charles A. Newcomb, of Jefferson county, and B. Smith, of Crawford county—which resulted as follows: Mr. O. A. A. Gardner, of Audrain county, in place of George R. Buckner; Mr. Wm. T. Essex, of St. Louis county, re-elected; Dr. Wm. S. Dyer, of Jefferson county, in place of Charles A. Newcomb; Prof. G. C. Swallow, of Boone county, in place of Dr. Morse, and B. Smith, of Crawford county, re-elected.

The president stated that the revised law, passed at the last session of the legislature, required the board now also to elect two additional members.

The board then proceeded to elect the additional members, which resulted as follows:

Mr. O. H. P. Lear, of Marion county, and George Husmann, of Gasconade county.

Prof. Swallow said that he understood that the operations of the board were often impeded by want of a quorum at the meetings. He thought that the habitual non-attendance of members should work a forfeiture of their seats in the board, and he therefore moved that the committees appointed to proceed to Jefferson City be instructed to have the organic law creating this board so amended as to enable the board to declare vacancies for non-attendance.

Mr. Lear, in seconding the motion, said he hoped the board would be intrusted with the power to rid itself of drones. For himself, he regretted that the choice of member had not fallen upon one more competent to fill the place. His youth and his manhood had been spent upon the farm, and as far as experience went, he had his full share of it; he regretted, however, that science had not accompanied his experience, and unlocked to him the mysteries and laws that governed results. He accepted the place assigned him with diffidence, but with the promise of diligence. And he hoped if there were any members who thought so lightly of the responsibilities of their position as to neglect attending the meetings, that power would be given the board to weed them out.

The motion was then adopted.

On motion, the annual meeting then adjourned.

JOHN H. TICE, *Recording Secretary.*

ST. LOUIS, January 9, 1867.

The annual meeting having adjourned, the president called the board to order, and the following members answered to their names: Messrs. Dyer, Essex, Gardner, Husmann, Lear, Smith, Swallow, and Mudd, president.

Absent—Messrs. Gœbel, Harris, Kellerman and Muench.

The president stated that the new law required a reclassification of members, one-third serving one year, one-third two years, and the remaining third three years. Whereupon, it was resolved that twelve ballots be placed in a hat numbered so as to correspond with the term of service of the classes, and that a ballot be drawn as each member's name was called, and that the term of service of each member correspond with the number of the ballot. The drawing resulted as follows:

Class first, to serve one year—Messrs. Essex, Gardner, Harris and Kellerman.

Class second, to serve two years—Messrs. Dyer, Muench, Mudd and Smith.

Class third, to serve three years—Messrs. Gœbel, Husmann, Lear and Swallow.

On motion, the board then proceeded to the election of officers for the ensuing year, which resulted as follows:

Henry T. Mudd, president.

George Husmann, vice president.

John H. Tice, recording secretary.

L. D. Morse, corresponding secretary.

Wm. T. Essex, treasurer.

Mr. Smith, of the committee to which was referred the account current of the treasurer, reported that the committee had examined the same and found it correct, and all the disbursements to correspond with the warrants drawn upon the treasurer by the executive committee.

On motion, the report was accepted and adopted.

Prof. Swallow stated that in prosecuting the duties of state geologist he had analyses of soil made from all sections of the State, numbering several hundred localities. These analyses were still in his possession. And as they gave interesting information not only to the citizens of the State, but to those wishing to immigrate hither, of the geological formation of the various sections of the State, and of their adaptability to special pursuits, he thought perhaps it was advisable to embody them and some other matter in a condensed appendix to the annual report, or separately. To do this a small appropriation would be necessary. He therefore suggested that the matter be given in charge of the committee to secure the proper legislation, already appointed.

The matter was so referred.

On motion of Mr. Essex, Prof. Swallow was added to the committee on legislation.

Adjourned to Friday, January 11, at 9 o'clock A. M.

JOHN H. TICE, *Recording Secretary.*

St. Louis, January 11, 1867.

The board met pursuant to adjournment.

Present—Messrs. Dyer, Essex, Gardner, Lear, Smith, Swallow, and Mudd, president.

Professor Swallow submitted the following preamble and resolutions, which were adopted:

Whereas, This board, organized under the laws of the state for the promotion of the great interest which is the basis of the material prosperity of all the business of the state; and whereas, the members of this board are required to perform the duties imposed on them without any pecuniary compensation; therefore,

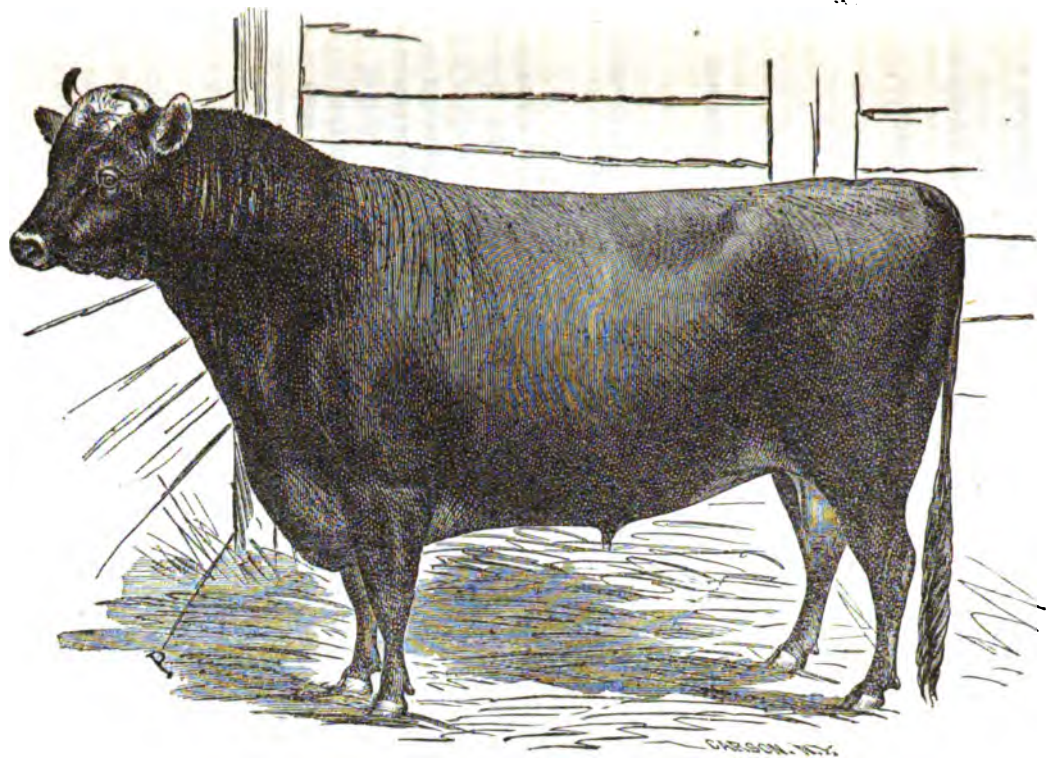
Resolved, That the president of this board be directed to transmit a copy of this preamble and resolutions to all the managing officers

of the railroads in our state, and ask that the members hereof be passed on the roads when in the discharge of their duties.

Resolved, That the thanks of the board are due to the several railroads of the state for past favors.

The board then adjourned, subject to a call of the president.

JOHN H. TICE, *Recording Secretary.*



ALDERNY BULL "JERRY," TWO YEARS OLD.

Winner of the first prize at the national agricultural show, Jersey, April, 1865—also winner of the first prize at the fair of the New York state agricultural society at Saratoga, September, 1865. Imported by, and the property of, W. B. Dinsmore, Staatsburg, Duchess co., N. Y.

COUNTY REPORTS.

AUDRAIN COUNTY.

BY O. A. A. GARDNER.

MEXICO, Mo., December 4, 1866.

At your request I again attempt to make out a report for our county, and though you gave me an abundance of time in which to get it up, a press of other business has made it necessary to defer the writing of this until nearly the last day; hence I must make an apology for the lack of attention I had intended to give to the report.

Our county lies on the "divide," or "ridge," midway between the Mississippi and Missouri rivers, and is dry and rolling. Timber is quite evenly divided over the county, being in little belts along the streams, but the prairie is largely in excess, making the possession of a good tract of timber land quite an object.

In some parts of the county there are fine springs, but most of the residences are supplied with water from cisterns. In most places the cistern is dug and simply walled up with brick or stone; plastering or cementing being unnecessary, as the clay will hold the water in nearly every case. Nearly every farm has one or more "ponds," made by daming up near the head of some ravine, or by excavating a place large enough to hold the requisite quantity of water. Where wells are dry and living water found, it is generally hard water, or tastes of the coal underlying most of our county.

The soil is generally of clay underneath, with from one to two feet of vegetable mold on the top. The clay subsoil is retentive of water, as is evidenced by the above statement in regard to making cisterns.

Numerous streams, in sizes varying from the little brooklet, that dries up with a few days of sunshine, to the streams that pour down to the Mississippi a torrent. Several streams are from a yard to rods wide, and during the spring and fall are full of water, rendering it impossible to cross them except at the bridges. The water in all the streams is what the wash-women call "soft water."

Several sites for water power can be found on the different streams, but there are none used now. A few of the sites have been improved, partially, for milling purposes, but the work was of rather rude construction and has been swept away by freshets.

We have some very good timber. White and bur oak, walnut, hickory and ash are the best kinds; black and water oak, elm, cottonwood, sycamore, linn or basswood, birch, etc., are the less valuable kinds found in our county.

Plums, blackberries, strawberries, grapes and gooseberries, among the wild fruits, are very abundant in some parts of the county, while wild cherries, black and red haws, persimmons, etc., are plentiful in most parts of the county. Walnuts, hickory-nuts and hazel-nuts are very abundant most years.

Government lands have long since been bought up. Large quantities were bought up years ago by non-resident speculators, and to this day large tracks are held by the persons who originally entered the land. There are no lands in the county held by corporations, except a few small tracts owned by the banks—principally held by the Farmers' Branch of the State Bank at Paris. The average price for improved lands is probably about fifteen dollars per acre—running from eight dollars per acre for farms with but little improvements, and distant twenty miles from the county seat, all the way up to forty dollars per acre for the better improved place with good house, out-buildings and young orchard. Wild land of excellent quality for farming purposes can be had at various prices, averaging about seven dollars per acre.

We have abounding in our county a fine quality of building stone. Limestone is to be found in nearly every township, while sandstone is found in various portions of our county. Coal underlies nearly every square mile of this county. During the year quite a number of new banks have been opened, and generally the quality of the coal is better than that obtained by "stripping"—the mode formerly adopted to get out the coal. Neither iron, lead nor copper ores are found in this county. The "oil fever" has subsided, and now, in the clear light of scientific examination, no indications of oil are known in this county. Not many months ago the little "oily" indications found occasionally in the timber land in low places, arising from the decaying leaves, could be adroitly worked into a "flowing oil well," and money could be had to lease or purchase the land at enormous figures. This day of excitement has passed away, and we can look back to the past only for an illustration of the truth of the old saying that "fools and their money soon part."

There are no flouring mills in the county that do merchant work. A few mills that grind corn have up bolting apparatus and make flour for home use. A first-class flouring mill is now in course of erection at this place. A number of saw-mills are running in this county; some by horse-power, but most of them by steam. We have no foundries in the county, but one is contemplated to be put up as soon as the weather will permit in the spring. A small machine shop has been put in operation here the past summer, which has proven a great convenience to our farmers and mechanics, enabling them to get their repairs at home, and thus save the time and expense of sending to St. Louis. This company have bought the patent, for part of North Missouri, of John R. Davis' I X L corn-planter, and intend to introduce them next spring. Two of these planters were used here last spring and all pronounced them ahead of Brown's planter in several points. One woolen, one tobacco and one plow factory are all in the line of factories that I can report in this county. The woolen factory is owned by Carnforth & Sons, the tobacco factory by Harper, Price & Co., and the plow factory by F. Tincher & Co.—all in Mexico.

There is probably no county in the state where a greater variety of farming implements, in proportion to the amount used, can be found than in this county.

I do not know what might be called the "leading" kind of reaper, mower, corn-planter, sulky plows, etc., but I can say that most of the popular kinds have been introduced and have attested the superiority of machinery over the old and slow hand process. A large per cent. of all the corn planted last spring was planted with two-horse planters, and very little hay was harvested that was not cut with the quick-working mower. Improved machinery is fast taking the place of the old fashioned hand modes.

In my report for last year I stated that our old agricultural society had died out. In May last an effort was made to revive the society, and the result was a success. A nearly new board of directors were elected; one of our most intelligent farmers was elected president, and thus the society was revived, and placed on the way to success. The directors labored under many difficulties, but a firm determination to have a fair that should be creditable to our county led them on, and, at length, the appointed day for opening the fair came, and though the time had been short in which to do the work, we had, at an expense of over six thousand dollars, fenced ten acres of ground with a tight fence, eight feet high, built a covered amphitheater (over half way round the ring), capable of seating six thousand people, erected stalls, made out-buildings, etc., second to no fair grounds in the state, except St. Louis. As the law requires our secretary to make a report to you, I will refer you to his report for further particulars, list of premiums awarded, etc.

The general effect of our fair this fall, I think, will be for good, in stimulating our farmers and stock men to strive for greater improvement. In a crowd of from six to ten thousand people everything exhibited will be discussed—good as well as weak points will be pointed out—and the dullest farmer that ever attended a fair will be sure to get some new idea which will lead to improvement.

I have no data from which to give an estimate of the proportion of our county in cultivation, and, from my own observation, I could not vary the estimate I made last year, which was one-tenth. Considerable new land has been broke during the spring and summer, and will be fenced this winter, so that next year we can raise the per cent. somewhat.

The number of inhabitants will not, probably, vary much from ten thousand, and every day adds to the number.

The chief productions of this county may be said to be corn, wheat, oats, rye, potatoes, sorghum and tobacco, though many other kinds of crops are grown to some extent, and do well.

The average yield of wheat among the best farmers, as near as I can get from inquiry, is about twenty-two bushels per acre; the average for the county is not over fifteen. Fall wheat is raised almost exclusively, many of the old farmers asserting, quite positively, that spring wheat cannot be raised here successfully. Not a rod of subsoiling has ever been done here for wheat, that I can hear of. The drill has been used by a few, and, as near as I can learn, drilling is considered better than broadcast sowing. No under draining has been done in this county; our farmers have contented themselves with God's provision in shaping the land for surface drainage.

The corn crop is usually a heavy one in this county, averaging, in a good season, about ten barrels per acre. (Here let me enter a protest against the custom of measuring corn by the barrel. It means corn enough to make five bushels of shelled corn—so when corn is estimated at ten barrels per acre, it means fifty bushels of shelled corn.) The yellow corn is considered best for stock. It is generally fed in the ear or from the shock; very few ever grind it. Our corn is almost exclusively marketed in pork and beef.

Rye, oats, barley, buckwheat and potatoes generally do well here, but I cannot give any correct idea of the average yield.

Sorghum has been raised here largely, both the common cane and the imphee, but I cannot learn the average yield. Some report getting at the rate of over four hundred gallons of sirup per acre, while others fall below fifty gallons.

The upland is generally thought the best for cane. The bottom lands will produce the largest canes, but they are far inferior in sweetness to the upland canes. Many wooden rollers are used for crushing the cane, but all admit the cast roller mills are far superior. Several new evaporators have been tried, but as yet the Cook's pan stands at the head of the list.

Hemp, cotton, and flax are not entitled to rank as productions of this county, though each has been raised in a small way, but not for a business.

Tobacco is raised quite extensively here, but I am not posted as to the yield, kinds raised, etc.

Sheep are raised by most farmers for their own use, and to sell both as mutton and wool, but I can give no idea of the amount shipped or consumed in our county. Some flocks of several hundreds each have been brought in this past summer. Wm. T. Cook, of Fair Oaks postoffice, has a large flock, but I do not know the breed. Mr. Judkin has bought property in our city, and is largely engaged in raising merino sheep. Our county affords unequaled facilities for sheep raising. Wild pasturage is abundant and sheep do well on it. Yes, there *is* much injury incurred by dogs; more sheep have been killed by them in the past year than all the dogs in the county are worth. Urge on the dog tax. A man who owns a really good dog will be willing to pay one or two dollars tax per year for the sake of taxing out of existence the worthless dogs that injure the morals of his.

Nearly every farmer has his meadow of tame grass—most of them timothy and clover—but I am not prepared to say what is the average yield per acre.

I hear of no new hedges being put out the past season, but arrangements have been made to put out largely next spring.

I have no means of finding out the number of hogs marketed from this county, nor can I give correctly the average weight. Some improved breeds have been introduced, but not long enough to produce any change in the general stock. Mr. Milton F. Simmons, an enterprising young man from New York, has bought a farm in our county during the past year, and is introducing and intends breeding several kinds of improved stock. He brought from Canada this summer a fine young Lincolnshire buck, imported from England in June last, which was exhibited at our county fair, and was admired by everybody.

Cattle are raised largely, and are mostly marketed in St. Louis. The number in the county and sold annually I cannot give. I do not know of any improved breeds being introduced during the past year. No one is breeding for dairy purposes, nor are there any dairies in the county.

Horses and mules are raised largely, but I do not know that any special effort is being made to improve breeds.

Fruit culture is decidedly on the increase, as the thousands of dollars' worth of trees delivered at this place this fall will attest.

I do not know that we have what might be called a professional fruit grower in our county. There are no vineyards in our county, though grape culture is on the increase, and many persons have out from five to one hundred vines, and a few persons have out several hundred each. Most of the grapes have been put out in the last two years, hence the yield cannot be given yet.

Without any exaggeration, I can say that few counties in the state present better openings than ours for those who desire to make a living by cultivating mother earth; whether for grain, fruit, or stock raising, we solicit a comparison of our county with others, by those looking for homes in Missouri, feeling sure that Audrain, in the year to come as in the year past, will receive her proportion of the new settlers in our state.

Our market facilities are unsurpassed. On the North Missouri railroad we reach St. Louis by one hundred and eight miles of travel. North, the road is being constructed from Macon toward the Iowa line. Reaching the Iowa boundary all the connections will be made soon so we can traverse the entire length and breadth of that great state, opening to us of North Missouri an unfailing market for all the fruit we can raise. Our county lies in the center of the richest agricultural portion of the state, and hence offers unequaled facilities for capitalists to invest in manufacturing.

We claim that Audrain is the "garden" county of the state, and as such we would be glad to see more cultivators come among us. We have many thousand acres of the virgin soil in market at reasonable prices. We have vast seas of prairie all ready for the plow and seed—no "grubbing" or "clearing" is required—and then we have many improved places that can be had for a reasonable price. We want, above all, scientific farmers who will be living examples for us in improved modes of cultivation, in subsoil plowing, in underdraining; in fact, all that goes to make up scientific farming.

BARTON COUNTY.

Spring and June moist and cold, July and August dry and hot, autumn moist and cold.

We had a full crop of apples and peaches. Pears, grapes and other kinds of fruits are not cultivated to any extent, The native grape grows to greater perfection here than any I have seen in Kentucky, Ohio, Indiana, Illinois, Iowa or Arkansas.

There seems to be a growing interest in the culture of fruit.

The corn crop was cut short—about one-half of an ordinary crop, in consequence of a dry July. Oats and wheat as good as usual.

The crop of grasshoppers was more abundant last fall than usual. They have destroyed our prospects for a wheat crop next year.

Very respectfully, etc.,
L. M. TIMMONDS, *County Clerk.*

L. D. Morse, Commissioner of Statistics, St. Louis, Missouri:

DEAR SIR: My absence from home will be a sufficient excuse for not sooner complying with your request by circular of December, 1866. All the information you desire, and which would be a pleasure to give, I have not at my command. Barton county was unfortunately situated during the war through which we have just passed. The inhabitants were robbed of their goods and chattles, then driven out to seek shelter elsewhere, or murdered; their buildings and fences burned, orchards and shrubery destroyed, and desolation reigned. The third and fourth years of the war there were but two families in it, consequently the report that I shall be able to give will be meager.

The months of March and April were very wet, and the heavy rains were accompanied with driving winds; the temperature of the air not favorable to the growth of vegetation. May came in warm and pleasant—the sun sent his heating rays upon as busy, industrious, and persevering a community as ever felt his genial heat, every one trying to repair their losses as best they could with the little means at their command. Most were poorly supplied with teams and implements of husbandry, yet with a truly commendable resolution, were surmounting every obstacle, erecting dwellings and fences, planting and sowing, and making every possible effort to husband well the little they had left. The month of May was a pleasant month, with three good showers, accompanied with thunder and lightning. June, July and August were dry and warm, the mercury standing frequently from 90° to 98° in the shade. From about the middle of June to the first of September, had no general rain. There was a very little rain in certain localities, yet frequent appearances of coming rain, thunder and lightning, and sometimes wind. Corn was much injured for the want of rain, none falling (in some localities) from the 15th of June to the 2d of September, when we got fine rains, and corn was much benefited, also potatoes and other vegetables. Corn was scarcely an average crop, potatoes good. Of wheat there was scarcely any sown, few persons having returned to the county in the fall of 1865 in time to sow fall wheat, and we raise no spring wheat in Barton. It has been frequently tried, but without success.

Oats were very good, more that an average crop. Garden vegetables were fair. Cabbage, turnips and other vegetables were badly injured by the grasshopper that came upon us from the west about the middle of September, and remained until the first of December, destroying completely all the wheat and rye sown. The quantity sown was perhaps greater than ever before.

Barton county is undoubtedly one of the best fruit growing counties in Missouri or the United States. Apples, peaches, pears, cherries, plums, grapes, black, straw and raspberries, gooseberries,

currants, and every species of fruit adapted to this latitude, grow well and produce abundantly, with a delicious flavor. Our orchards and shrubbery were badly injured, and in some cases were totally destroyed during the war, but where there are apple orchards left there was an abundant crop. Peaches and all the smaller fruits were abundant, and the cultivation of fruit generally is rapidly on the increase. This county is peculairly adapted to the culture of the grape; the fruit is large and fine flavored, and scarcely ever suffers from the blight. As yet the grape is but little cultivated in this county, yet enough has been done to warrant the most flattering prospects for a rich reward.

We have a large fox grape, growing wild on high timber land of a thin rocky soil, that are fully equal in quality to some species of the tame or cultivated grape, and they produce every year in great abundance and delicious quality.

Hay was a full average crop. Timothy and blue grass are best adapted; blue grass will take the prairie.

Respectfully submitted,

DAVID NORRIS.

BATES COUNTY.

Bates county is located on the western border of the state, in latitude thirty eight degrees. It consists principally of fine rolling prairie, rich limestone soil, well adapted to the growing of all kinds of cereal grains and tame grasses.

The Marias de Cygne, the largest river, flowing through the county in a southeasterly course, is a rapid stream some three hundred feet in width, with several unimproved mill sites on it. Grand river, the next in size, in the north part of the county, is a stream two hundred feet in width, with also quite a number of unimproved mill sites. Deep Water, next in size, is not of sufficient size to afford water power. The other streams consist principally of the Miami, Mulberry, Mound creek, Mormon fork, Elk fork and Panther creek. These, with their tributaries, traverse different parts of the county. Their sources are generally derived from springs consisting of both hard and soft water, and are bordered with fine groves and heavy bodies of timber, giving an agreeable and picturesque appearance to the county.

The principal varieties of timber are black walnut, bur oak, whiteoak, postoak, hickory, pecan, hackberry, maple, linn and elm; while wild fruit, consisting of plums, cherries, grapes and persimmons, grow in abundance.

There are no government lands in the county. Nearly one-half the land in the county is owned by non-residents, who are disposing of them at fair rates generally; improved farms are selling from twelve to sixteen dollars per acre; wild lands from three to five dollars per acre.

Coal is abundant in all parts of the county; on non-resident lands, can be had for digging. The veins are generally from eighteen inches to four feet in thickness—generally from three to six feet below the surface. In the northwest portion of the county, near Parkerville, are several springs, the surface of which, in warm weather, is covered with petroleum, and a company has purchased a lease, and intend sinking a well for oil.

The implements used for farming generally, are the Diamond and Clipper plow; also, Sattly's and other gang plows have been introduced; while all varieties of cultivators, from the single shovel to the improved sulky cultivators, which have been introduced the last season, have given good satisfaction. The Ball reaper and mower, the Hubbard mower, the Russel combined machine, are in use and give general satisfaction.

There was an agricultural society organized in 1866, and held fairs that and the following years, with a creditable show of stock. The war soon following, disorganized everything connected with it.

There is about one-twelfth of the county under cultivation, being evacuated by a military order during the war. The prairie fires swept over the country, devastating everything, reducing the improved farms almost to a state of nature, from which it is rapidly improving.

Wheat is not extensively cultivated, although on sod and new ground is considered a sure crop, averaging fifteen to twenty bushels per acre, sown broadcast. There are no wheat drills in use in the county. I think they would be a valuable acquisition to the agricultural community.

Corn is the principal crop raised, for which the soil is well adapted, averaging, of a seasonable

year, fifty bushels per acre. The surplus is fed to cattle, hogs and mules, which find a ready market at home, or are driven to Pleasant Hill, forty miles, and shipped to St. Louis; although the western market is often the best for cattle and mules, to fit out those immense freight trains across the plains.

Rye, oats and barley do as well here as in any good corn county, although not as extensively cultivated as further north, where the demand is greater, and stock range limited; more frosts, consequently more demand for straw piles.

Sorghum is extensively cultivated, the soil and climate being well adapted. A person can readily discern the difference in the superior quality of sirup manufactured from cane grown here and further north, by the same process.

There are no large flocks of sheep in the county, although there is plenty of room for them. The few flocks we have are of the mongrel breed, and seem to grow large and thrive well. I think woolgrowers will find this county without a superior for their business.

This is pre-eminently a stock growing county, with vast, unlimited range, mild climate, and well watered country. Stock are healthy, thrive well, and mature quickly. Numerous droves of cattle from Kansas, and the counties north, in Missouri, are driven to this county, to winter on the range of the Marias de Cygne, Miami, and other streams.

Hedges of the Osage orange have been grown with good satisfaction, proving invaluable to those whose farms were inclosed by them during the war, as they withstood the prairie fires, and will eventually prove the most practicable system of fencing in this county.

Timothy, clover, and blue grass thrive well in the oldest settled parts of the county. As the prairie grass is tramped out it is replaced with blue grass. In door yards, where it has been seeded down, it grows luxuriantly, and when some of the cornfields come to be replaced by it, I have no doubt it will be celebrated as a blue grass county.

Apples, peaches, pears and plums succeed well in this county. Peaches are said, by the old inhabitants, to be as sure a crop as weeds. Apples rarely fail. Of the varieties the genitan is the standard for winter apples; early harvest, red June, for summer; the yellow bellflower, romanite, rambo and wine sap succeed well.

There are no vineyards in the county at present, although wild grapes grow in great abundance in the woods, from which we would conclude the soil and climate well adapted to grape culture.

BUTLER, BATES COUNTY, MO., January 13, 1867.

Mr. L. D. Morse:

DEAR SIR: I received your circular requesting information in regard to the general character of the season of 1866, which I shall attempt to answer briefly. The spring, commencing with the month of March, was quite cold and windy; no progress made in farming; generally considered a backward month for this latitude. April was ushered in by genial showers, starting the grass, though remaining cold; small grain all sown. There was some fine weather in the early part of May, but from the 15th out there were heavy rain storms; the month generally called cold and wet; corn nearly all got in. June was quite wet; storms frequent, accompanied by violent thunder. Wet weather impeded the proper cultivation of corn. July 10th drought commenced; very hot and dry; with the exception of a few scattering showers no rain for four weeks, since which time rather seasonable; occasionally an excess of rain.

Apples not an average; peaches full crop; cultivation of fruit increasing rapidly; no grapes cultivated in the county.

The corn crop was short, on account of the drought. Oats yielded well. No other crops were cultivated. Winter wheat sown all destroyed by the grasshoppers. As this is the first crop raised since the war, and as the county was totally depopulated during the war, no comparison with previous crops can be made. As the farmers have been baffled in attempting to raise winter wheat by the grasshoppers, quite a number intend sowing spring wheat. The result may prove valuable and interesting, which time will prove.

Yours, B. H. THORNTON.

BOONE COUNTY.

COLUMBIA, MISSOURI, January 17, 1867.

Dr. L. D. Morse, Secretary Board of Agriculture, State of Missouri:

Boone county, situated in central North Missouri, is in a most prosperous condition. The early completion of that part of the Boone county and Jefferson City railroad, leading from Columbia to the North Missouri railroad, at Centralia, is a certainty, the work of grading, etc., being already about two-thirds finished, iron bought, etc. There will also be constructed during the ensuing summer three rock roads leading from Columbia, the present terminus of the railroad—one to the Missouri river, at Claysville, by the way of Ashland, twenty-two miles; one to Rocheport, about fourteen miles, and one in the direction of Fulton, to the Cedar creek, twelve miles. The county appropriation to these roads, together with the private subscriptions of stock, insure their early completion. The facilities of transportation, with all these roads completed, with the Missouri river washing fifty miles of its southern boundary, and the North Missouri railroad passing through the northern portion, are not exceeded by those of any county in the state, except St. Louis.

In reference to our agricultural prospects, etc., our farmers are much impeded in their operations by the scarcity of labor. The products of the past year fell very much short of that of previous years, owing partly to the want of laborers, but principally the unfavorableness of the season. Our people, by the recent introduction of improved agricultural implements and machinery, are enabled to cultivate as much land as they did before our system of labor was changed, or when labor was more abundant. Still the need of labor is very great, and many important interests are neglected on that account.

Our principal crops are corn, wheat, oats, timothy, blue grass, clover and tobacco. The growth of the latter, however, has much decreased in the past few years. The production per acre of the corn and wheat crops cannot be excelled by any land in the western country. Our farmers pay much attention to the raising of stock, particularly mules and cattle, in which they find much profit. Our soil is of the most prolific character, easily worked, and yields abundant returns for the labor bestowed; but our farmers generally cultivate after the old style, and are lamentably ignorant of the nature and qualities of soils, and of their adaptation to particular crops.

A subject so connected with agriculture as the location of the agricultural and mechanical college, provided for by an act of congress, may well find a place in this report. Shall the proposed college be a distinct, independent institution? The only means now provided to endow and support the college are the proceeds of 330,000 acres of land, selected in this state, which have long been in market without finding a purchaser, which may be sold at some price at some future time. Of the proceeds, ten per cent. may be used to purchase a farm, but not one dollar can be taken to erect buildings, buy books, apparatus, or anything needed to make the college useful. It must be apparent to all that the fund is entirely inadequate to make the college a success without very large donations from the state at the outset, to be continued, perhaps, annually for a long series of years. The question then arises, would it not be better to connect this college with some institution already established? If so, what one? The eye involuntarily turns to the university of the State of Missouri. Here the state has already an institution in successful operation, with buildings, grounds and apparatus, library, etc., professors, and all needful appliances to suit the wants of five hundred students more than we have. The property now here—all of which will be indispensable in the proposed college—cannot be built or had for $300,000. This is the first outlay. But the professors now here, with a few additions, can do all that is needful for the classes in the university, and also in the proposed college, thus making an annual saving of from twelve thousand dollars to fifteen thousand dollars for all time to come; as the same number of professors will be necessary in the agricultural college, if established elsewhere.

The university is centrally located (with a railroad certain of completion by July 1, 1867), very accessible, in a very healthy and fertile country, and with an able corps of teachers, splendid and commodious buildings, cabinets, apparatus, etc., wholly under the control of the state, offers advantages for the location of the agricultural college which no other point can present. In addition, every state* which has acted on the location of these colleges, has connected them with some endowed and established institution, it being conceded that even in the states getting the largest fund under the act of Congress, the means being still inadequate otherwise to make them successful.

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*In this statement our correspondent is in error. Massachusetts, New York, Pennsylvania, Michigan, Maryland and Iowa, at least have devoted the national agricultural college grant either wholly or chiefly to independent agricultural colleges. To this list, we think, may be added Minnesota, Kansas, Illinois, and perhaps Maine. Local or individual means have generally, however, been needed and found for these institutions.—*Corresponding secretary.*

But were all this the reverse of true, the constitution, which the legislature is bound to obey, requires an agricultural department to be connected with the university. It would be an insult to the intelligence and morality of the state to suppose that this provision of the organic law will not be carried out; it must be carried into effect, and will be some day. How opportunely does this congressional bounty come to the aid of the state, in putting into action this noble feature in our new constitution. If any other direction is given to this grant, then it results that the state, borne down with debt, its people groaning under the burdens of taxation, are called on to enter upon the work of erecting and maintaining two agricultural colleges. By connecting with the university, however, the annual saving alone, to say nothing of the enormous cost of buildings, etc., which will be avoided, will be $20,000 or $25,000 to the people of the state.

Respectfully,

JOHN M. SAMUEL.

COLUMBIA, MISSOURI, December 27, 1866.

L. D. Morse, Esq.:

In answer to your inquiries, I would say, that during the year, 1866, the season, as a general thing, has been very unfavorable for agricultural pursuits. The spring was very wet and backward. Farmers were late in getting in their corn crops; indeed, so much so, that a large portion of it failed to mature. The summer was unusually dry and hot, the drought, together with the late planting, cut the corn crop down to about the half of the usual quantity. The autumn was mild and favorable for farming operations. The wheat crop was put in in good time and looks well.

We had a full crop of apples, but of very inferior quality. They seemed to commence rotting early in the fall, and by gathering season at leat one-third of the crop was destroyed; about half the remainder seems to have been penetrated by a small worm, which has greatly damaged them. We had but few pears, peaches, or grapes; in fact, the grape culture has received no attention in our county. Our people are, however, beginning to pay much more attention to fruits generally, and small fruits particularly, than formerly.

In regard to the relative condition of crops, our wheat crop was about one-half; was damaged by freezing out last winter and by fly. Corn about one-half, occasioned by late planting and drought. Oats about an average crop. Hay crop about one-third larger than usual. Barley, none raised.

I will give, before January 1, a report of the general prospects of Boone county, improvements, etc.

Yours, respectfully,

JOHN M. SAMUEL.

CAPE GIRARDEAU COUNTY.

BY H. H. M. WILLIAMS.

Cape Girardeau county is situated on the Mississippi river, the lower corner being forty-five miles above the mouth of the Ohio river, and the upper, one hundred and twenty miles below St. Louis. Cape Girardeau, the principal city of this part of the state, is located in this county, one hundred and fifty miles below St. Louis. A few miles above Cape Girardeau commence the high bluffs on the river. These bluffs are the highest points in the county. As you recede from the river, the hills become less and less, until a moderately hilly, undulating country is reached, well fitted by its topography and soil to agricultural purposes. The river hills are esteemed valuable for fruit growing, and especially for the growth of the grape, though but little has been done, as yet, in that direction. If the growth and thrift of the wild grape gives any assurance of what could be done with the domesticated varieties, this section should take high rank as a grape growing country.

Just below the city of Cape Girardeau the Big swamp commences. It follows the boundary

line between this and Scott county, or rather that line is located in the swamp. That part of the county embraced in the swamp is generally too wet for cultivation, but much of it is first rate meadow and grazing land.

The soil of the county, like its diversified surface, varies in character and quality; but in general, it may be called a good limestone soil. Very little of the county, except the river hills and the swamps, is unfit for general cultivation.

This county can boast of no river, except the great father of waters, washing its eastern border; but the smaller streams and springs abound. White Water traverses the western part of the county, from north to south. It has a width of about eighty feet and an average depth of three or four feet. It affords excellent water power throughout the entire year. Quite a number of good sites for locating such power are found, some of which are occupied by mills, others unimproved. Apple creek, dividing Perry and Cape Girardeau counties, is a smaller stream than the preceding, but affords good water power. Four sites on that stream have been occupied by mills, but only two are now in operation. Byrd's creek, Crooked, Hubble, Indian, Flora and Cain creeks, to a more limited extent, afford good power. On Hubble and Crooked creeks, saw and grist mills are successfully operated. There are other smaller creeks, purling brooks and perennial springs, affording to all parts of the county an abundant supply of good water. The water furnished by those springs is generally hard.

The principal timber trees of this county are the oak and poplar. We have almost every variety of the oak known in this state, and it is found in abundance and of fine size and quality all over the county—from the lofty cliffs of the river to the quagmires of the Big swamp. The poplar is also large and fine, but does not cover so much of our territory as the oak. The county also abounds in ash, hickory, black and white walnut, white and sugar maple, white and red elm, wild cherry, persimmon, ironwood, dogwood, mulberry, redbud and pawpaw; and, to a more limited extent, may be found hackberry, beech, locust, sassafras, cottonwood, sycamore, willow, boxwood, birch, coffee-nut, pecan, cedar and cypress.

The wild fruits usually prevalent are the blackberry, dewberry, service and whortleberry, raspberry, alderberry, plums, black and red haw, summer and winter grape, pawpaw, persimmon, crabapple, wild and ground cherry. There is also a great variety of nuts, such as the black and white walnut, hasle-nut, pecan, hickory-nut, coffee-nut, etc.

Among the vines and shrubs are the grape vine, trumpet flower, green briar, honeysuckle, sweet briar, wild rose, hazel, wild hop, morning glory, ground cherry, American ivy, etc.

Not having access to the register's office, it cannot be definitely stated whether there are any government lands in this county now or not. If there are any, the amount must be very small, and the land of very little value.

There are some ten or twelve thousand acres of swamp and overflowed lands, donated by the United States to the state, and by the state to the county. These lands are mostly low and too wet for cultivation. Much of it might be reclaimed by short ditches, but most of it will remain a wilderness until the county adopts some general system of drainage by which the whole section can be relieved of its surface water.

But little more than one hundredth part of the land in the county is owned by non-residents. None is owned by corporations, except about seventeen hundred and sixty acres belonging to St. Vincent's college, and the usual lots and grounds held for church and school-house sites and graveyards, and toll-houses on the gravel roads.

The price of land varies greatly, according to quality, location and other advantages. Perhaps twelve dollars and a half for improved, and five for unimproved, may be assumed as a fair average price.

No mines of lead, iron, copper, or other ores have been opened in this county, nor are these ores known to exist in any quantity in the county. Neither have any beds of coal been discovered. Some indications of coal oil were supposed to have been discovered a year or two ago, and preparations were set on foot for testing the matter, but as yet no experiments have been made in boring. White and gray marble, limestone and sandstone are found in great quantities. The Cape Girardeau marble is a superior building stone, and is used for monuments, tombstones, etc. It is also extensively used for making lime. The common blue and gray limestone is found more generally throughout the county than the marble and sandstone, which are confined to a few localities.

There are seven steam-mills and six water-mills, that grind both wheat and corn, or wheat exclusively. Those in the city of Cape Girardeau are of the finest class of mills. Two of the three located there are also of the largest class. There is only one foundry in the county, and no woolen factory as yet, but one is now in process of erection. There are several extensive lime-kilns, tan-yards, saw-mills, etc.

There is no establishment in our county specially devoted to the manufacture of agricultural

implements. The foundry above alluded to makes sorghum mills, plows and pumps. There are a great many blacksmith and wagon shops in Cape Girardeau and elsewhere that make plows, harrows, etc. There is one machine for cutting shingles at Jackson; also, a buggy factory.

There is no agricultural society in existence at present. In 1857 a county society was organized. Two fairs were held at Jackson, with very good success. It then became merged in the southeast district society, which continued to hold very good fairs until the inauguration of the late civil war. During the existence of these societies there was a marked impairment in the stock kept, and the implements and machinery used in the county. Since the fall of 1860 no fairs or even agricultural meetings have been held. No advance has been made during that time. Indeed, we have not yet recovered from the losses sustained during the war.

The population of the county is about fifteen thousand. It is difficult, in the absence of proper data, to state what proportion of the county is in cultivation. It may not exceed one-eighth, certainly not one-fifth.

The principal productions of the county are wheat, corn, oats, hay, barley, tobacco, sorghum, maple sugar and molasses, fruit, potatoes, and other vegetables.

Wheat is the leading crop raised for market. Our best farmers make about twenty bushels per acre on an average. The average of the county is not more than half that amount. Spring wheat is not cultivated at all. Subsoil plowing has not been tried. Drills were introduced on a few farms before the war, with very satisfactory results. Underdraining has not been tried. The aggregate amount of wheat raised in average years in the county is about two hundred thousand bushels.

Indian corn is more extensively grown than wheat, but less of it is marketed. The best farmers raise from forty to fifty bushels per acre; sometimes a much larger yield is obtained. The average crop of the county is about thirty bushels per acre. The white varieties are most raised in the county, although the yellow is generally esteemed best for stock, and yields more to the acre. Corn is usually fed in the ear without any preparation. It is marketed in the same condition in our own towns, but little being shipped. The average aggregate crop of the county is probably seven hundred and fifty thousand bushels.

Rye is but little grown with us. It yields from twenty to twenty-five bushels per acre. It is very valuable for winter and early spring pasture, and should be generally cultivated.

Buckwheat can scarcely be designated as a crop in this county. It is said to succeed well—yielding thirty bushels or more to the acre. But very few have tried it at all, and those only on a very small scale.

Barley and oats are more generally grown, but not extensively. The aggregate barley crop is perhaps four or five thousand bushels. The aggregate oat crop is some twenty-five or thirty thousand bushels. The average product of each is from thirty-five to forty bushels per acre.

Potatoes are grown by every farmer, but generally not beyond the wants of his family. The yield of this crop differs in quantity and quality very much in different years. Perhaps thirty-five or forty bushels is an average crop. Sweet potatoes are rather more certain in the yield than Irish, but do not average more per acre. Aggregate Irish potato crop about twenty-five thousand bushels; sweet, about half that quantity.

Sorghum is not very extensively cultivated. It is grown principally for home consumption. No sugar has been made from it. In the manufacture of molasses the common two-horse vertical iron mill and evaporater are used. Some, however, use the primitive wooden mill and washkettles for the purpose. The best soil for sorghum is the rich loam of our uplands. It will succeed well, however, on any good corn land. Preference is given to the red varieties.

Hemp is not grown at all, and flax only to a very limited extent for domestic uses.

Cotton was formerly raised in very small patches by a few farmers. At the commencement of the war, it had become almost extinct. During the war it was much more extensively grown; but, again, there is quite a falling off in the amount planted. Two hundred pounds per acre is about an average crop. A rich, dry soil is best for cotton.

Tobacco is grown here for market, but not to the extent our climate and soil would warrant. Good planters can make from twelve to fifteen hundred pounds per acre. The quality is not surpassed by that grown on the best tobacco lands of the Old Dominion. The average crop is about one thousand pounds per acre.

At the time of cutting the plant, the main stem is split to within four inches of the butt end. When sufficiently wilted to bear handling without breaking the leaves from the stems, it is hung on split oak sticks, four feet long. These sticks are then placed on scaffolds, four feet from the ground, where the crop is left a few days before transferring to the barn. When placed in the barn, a gentle fire is generally kept under the tobacco a short time, to hasten the process of curing. When sufficiently cured, it is taken down, stripped, assorted and handed. In this shape it is pressed in hogsheads and marketed.

This crop is regarded as very impoverishing to the soil, which, perhaps, may account for its very limited culture in this county.

There are no large flocks of sheep kept in this county; but most of our farmers keep some. Very little wool is exported. It is generally consumed in the manufacture of domestic fabrics. But sheep are very healthy, and there seems to be no reason why large flocks might not be kept here to advantage. I am not aware that the wool of imported sheep becomes coarser here. We have not, however, tried the fine-wooled breeds. Cotswold is about the only foreign breed introduced. A good deal of loss is incurred by the depredations of dogs.

But little attention has as yet been paid to the cultivation of the tame grasses for pasturage. Our clover fields, wheat and oat stubble, meadows, corn fields, and, above all, the wild woods, constitute our principal pastures. Blue grass and clover are best for early pasture; timothy and red top for summer. A mixture of these seeds would probably be better for permanent pasture than either alone. Timothy is generally preferred for hay, and is undoubtedly the most profitable. Clover yields largely, but is more liable to injury from weather in curing. It crumbles and wastes more in handling, and requires renewing oftener. Our hay crop averages about one ton per acre.

Owing to the superabundance of timber in all parts of the county, no attention has been given to the subject of hedges. Enough has been done, however, to establish the fact that the Osage orange grows thriftily here, and is not injured by the severest winter ever known in this latitude.

From two to three thousand hogs are slaughtered for export, or sent to market from this county. Their average weight is about two hundred pounds. Our stock of hogs is generally an improvement on the old landshark, but is not highly improved. In former years grades of the Byfield, Berkshire, Grazier, etc., were introduced, and, more recently, some Chesters, but no care has been taken by any breeder to keep up any distinct breed.

The whole number of cattle kept in the county is estimated at twelve thousand head. Of this number, perhaps one thousand or eleven hundred are slaughtered for export, or sent to market annually. The improved breeds have not been very generally disseminated through the county, but a good many Durhams were brought from Kentucky during the eight or ten years preceding the war, which have given an improved appearance to many herds, which is still visible. No importations have been made in the last six years, and very little attention given to breeding the stock we have. There are no dairies in the county, nor is any person breeding with reference to the dairy, but the farmers supply all the butter needed in town, and ship some surplus.

Horse flesh suffered greater trials during the war than any other in this county. Good horses are not often found in the wake of armies. Not even the stallions and mares, on which the future stock depended, escaped. Thanks, however, to the care and prudence of our farmers, we are left with a better supply of good animals than could have been expected. We are still very deficient in good stallions. We are now raising, under all our disadvantages, perhaps eight hundred or a thousand head annually. These are mostly roadsters, being crosses of various breeds. The average price of grown animals is from one hundred and twenty-five to one hundred and fifty dollars.

This county produces somewhere in the neighborhood of two hundred head of mules and asses annually. Our surplus was formerly sent south. After our relations with the south were interrupted, our mules went to St. Louis. The average price here is from one hundred and thirty to one hundred and fifty dollars.

There are no professional fruit growers among us, but all the best farms are supplied with fruit trees. Apples succeed well, and rarely ever fail. Peaches are more uncertain, but yield largely when not killed by the spring frosts. There are some localities where peaches scarcely ever fail. These localities are the highest and most broken parts of the county. Pears, grapes, plums and other small fruits succeed well, but are not generally cultivated. There are no vineyards in the county. Nothing more than a few vines in gardens and yards are met with.

The general condition of our agriculture has not yet recovered from the rude shocks of war, but is gradually improving. Labor is not abundant. Many of the late slaves left the county during the war. The freedmen remaining in the county are not contributing very largely to the industrial interests of the community. Few of them engage as farm laborers, preferring to rent land and work on their own account.

Labor is from seventy-five cents to one dollar a day, and from sixteen to twenty dollars a month, with board. Our farmers do not rely much on hired labor. Where a farm is so large that the proprietor would require a large number of hands to carry it on, a portion is generally rented out. In this way, however, most of the land formerly cultivated is again in cultivation, and though less thoroughly done, hopes are entertained that there is a future near at hand that will outstrip anything witnessed in the past history of the county.

JACKSON, MO., December 31, 1866.

L. D. Morse, Esq.:

DEAR SIR: In answer to your circular just received, I will state: the spring, as well as my memory serves me, was quite wet, early, and cool throughout. The summer was generally cool and dry. The autumn was, with the exception of a little excess of wet weather, the finest we have enjoyed for many years. I think we have had fewer thunderstorms this year than usual.

The fruit crop was, perhaps, altogether an average. The apple crop is not so large as usual, but the peach crop was quite full. Pears, grapes, etc., are not much cultivated. There is nothing like a vineyard in the county in bearing. I do not think grapes suffered much from rot or blight this year. The cultivation of fruit is not perceptibly increasing. The grain crop of this section of the country is better this year than last. The quantity of wheat is nearly the same per acre and of much better quality. The corn crop is not quite so heavy per acre as last year, but is an average crop. Oats and barley are better than an average. Hay is less in quantity, in consequence of the depredations of the army worms, than last year, but was saved in better condition.

The root crop, though not extensively cultivated, is good. I have never known better potatoes or turnips or a larger yield. Cabbage and other vegetables have done well.

Very respectfully,

H. H. M. WILLIAMS.

CASS COUNTY.

BY G. C. BROADHEAD.

This county contains an area of about six hundred and eighty-one square miles. Most of it lies well for farming. On its prairies are some as beautiful building sites and as fine views as are to be found anywhere in the state. The general surface of the county is undulating and rolling, but few bluffs are precipitous, and none of them very high. The hills generally rise from the bottoms by long and gentle slopes; the bottoms along the streams are generally wide; those on the larger streams from half mile to two miles in width, and are flat, with sometimes marshes and lakes. The uplands are undulating, with occasional gentle depressions, through which the smaller streams take their course.

The general course of all the streams is southeast. In northeast third of the county we have Big creek and and its tributaries; in south and west part, the county is watered by Grand river and its tributaries. The main forks of Grand river rise in northwest part of the county and pursue a southeast course through the center and southwest. None of the streams are rapid enough for water-mills, except when high, which may sometimes be for six months of the year, but they contain sufficient water for steam-power all the year. The rivers all originate in springs near the uplands. Springs of never-failing excellent water abound throughout the county near the higher lands, but are rarely found on low ground. Around Pleasant Hill, Austin, Harrisonville and the western part of the county water can be procured by digging fifteen to thirty feet below the surface of the higher lands; and we, indeed, often find on the uplands tracts of a quarter of an acre of marshy ground; here are excellent springs of water.

There is very little poor soil in this county; around Pleasant Hill and toward Harrisonville the soil on the uplands is generally, at least, two feet or more in depth—black and rich. Beneath the soil, we have the hard-jointed, yellowish clay of the bluff formation. The soil is generally as rich as any in the state.

Mills are scarce; one large flouring mill is being erected at Pleasant Hill.

This county formerly had an agricultural society in active operation, but the war cut off its operations, and as yet it has not been revived. The company own about twenty-two acres of land. The most active persons in starting the society at its commencment were Fisher, McClannahan, McReynolds and Thomas. Its last president was Thomas Thomas, and secretary, Logan McReynolds, both at present residing in Cass county.

Of recent years there has been but little attention paid to the raising of stock, when formerly the finest stock of all kinds were raised.

At present the principal productions are corn, potatoes, sorghum and fruits.

The best average yield of winter wheat is from fifteen to thirty bushels. Very fine crops can

be raised on the best fresh sod land. The crop depends a great deal on the manner of putting in the seed. We should plow deep and use a roller. The chinch bug is apt to be destructive to spring wheat.

White corn is best for bread; the yellow for stock, as also its blades. During the last three years the corn crop has been very fine in this county; the ears are large and full grained, and it seems really to grow better and yield more than I have observed anywhere before. Good farmers say that forty to sixty bushels is an ordinary yield.

Rye, oats, barley and buckwheat are all good crops to raise. Potatoes, both sweet and Irish generally produce well.

Most of the farmers raise sorghum, and it grows as well as anywhere.

Hemp and flax are not much raised, but they would grow well.

Some farmers raise a little cotton for their own use; they recommend early planting and topping. Mr. Green Story thinks he has raised as much as one thousand pounds per acre.

Millet and Hungarian grass succeed as well here as anywhere, but the Hungarian is not recommended for horses.

Grasses of all kinds succeed uncommonly well. Timothy and clover will set without any trouble. I have a lot of a few acres well set in clover and timothy, being seeded from the feeding of horses around a soldiers' camp two years ago. It has not been plowed for at least three years. And blue grass naturally grows everywhere, on the prairies as fast as prairie grass is eaten down. I have seen as fine blue grass pastures here as I ever saw.

Osage orange is much used for hedges. Dr. Allen says it is the best for this country and will grow four to six feet in a year. Mr. Thomas says it will grow as well here as in its native country. It has been used here about fifteen years.

There are no vineyards. Grapes grow well. Young orchards are being planted out everywhere. Some excellent fruit has already been raised here. I have seen as fine apples here as I have seen anywhere else, and we have good crops of them every year. The cold of the winters is sometimes destructive—often killing the peach trees; otherwise, we have peaches nearly every year. In the southern and western parts of the county there were excellent and large crops of peaches this year. Mr. Geo. Moore, of Austin, who has a nursery, says he has peaches almost every year. Mr. Thomas Thomas says, that to prevent borers in apple trees we should take off the loose bark in spring, and wash with a solution of soap, the solution neither too thick nor too thin. He formerly grafted; now buds altogether, and from first of July to first of September, budding only during the season of the bark running.

This year several persons raised the castor bean, and very successfully. One gentleman has a field of about sixty acres in black mustard.

There is a belt of timber along the streams, generally from one-half to two miles in width. On the smaller streams there is not much timber. The principal useful kinds of timber are white oak, red oak, bur oak, and laurel oak, hickory, elm, linden, white maple, black walnut, ash, coffee tree, honey locust. The principal woody vines are the grape (two kinds—the summer and frost), the vitis indivisa, Virginia creeper, sarsaparilla (menispermum canadense), poison oak, bitter sweet (celastrus scandens), clematis viorna, and the hop. Trees bearing fruit or nuts, are the black walnut, hickory, hazel, plum, persimmon, mulberry, blackberry, raspberry, gooseberry, black haw, red haw, wild cherry and sumach. The strawberry abounds everywhere on the prairie. The following plants, noted for their beauty, grow here:

Anemone Carolinianum.—Very rare; only found one plant, on a limestone glade.

Thalictrum cornuti.—Very tall, and branching; beautiful leaves, resembling those of the columbine; grows in shaded, rich bottoms, in midsummer.

Columbine (aquilegia canadensis).—Grows on rocky, limestone slopes, in spring.

Larkspur. -The deep blue (mostly in woods) and light blue (edges of prairie) are both very abundant; spring and early summer.

Nelumbium luteum.—A very pretty plant, growing on ponds, with large peltate leaves, and large, cream-colored flowers; has an edible nutlet.

Dutchman's breeches (Dicentra cucullaria).—A very pretty little plant, blooming early on shaded hillsides and bottoms; flowers somewhat flesh-colored.

Corydalis aurea.—An early spring flower, with pretty leaves, resembling the last; has a golden-colored flower; grows on limestone slopes.

Violet.—There are three species, all bloom early, and are very cheering after the dreary winter. The v. cucullata blooms early in the spring, and again we find it from September to November. We have, also, the v. delphinifolia and v. pubescens, catch fly (silene stellata), a beautiful plant abounding in the woods toward the last of July.

Hibiscus militaris.—Found in meadows. Not common.

Geranium maculatum.—Very common in shaded places, in spring. Quite pretty.

Red root (ceanothus ovalis and c. Americanus).—Both very pretty, and common on the prairie, with white, showy flowers.

Polygala incarnata.—Rare; on prairie. Very pretty.

Apios tuberosa.—A vine with pretty, dark-red flowers.

Pentstemon violacea and *p. candida.*—Both pretty; common on prairie.

Amorpha canescens and *a. fruticosa.*—Both pretty shrubs.

Desmanthus brachylobus (*or minosa Illinoisensis* and *shcrankia uncinati* (sensitive briar).—Both beautiful; the first rare, growing on limestone slopes; the latter common on prairie, with beautiful, sy flowers.

Rose (rosa retigera and r. lucida).—Common.

Crataegus tomentosa.—Common in woods.

Pyrus coronaria (crab apple).—Beautiful flowers, with delicious fragrance; edges of prairies.

White primrose (Oenothera speciosa).—A very pretty plant, with large, white blossoms; generally grows on limestone slopes; not found east of this place.

Mentzelia oligosperma.—Rare, on limestone slopes; noted for its numerous barbed prickles.

Cactus.—One species (Opuntia Missouriensis). Wild balsam or cucumber.

Echinocystus lobata.—On rich bottoms, in woods.

Sedum pulchellum.—A pretty, succulent plant, only on limestone glades.

Collinsia verna.—A very pretty little blue and white flower; on high, shaded bottoms.

Girardia.—There are three very pretty species, of pale rose color.

Painted cup (castilleia coccinea).—Rare; on prairie.

Dipteracanthus strepens.—A very pretty plant; grows on rich bottoms.

Verbena subletia.—A very pretty pink, and sometimes purple flowered plant; blooms all summer.

Sage (salvia).—Two specimens of blue, one large; showy plants; on prairie.

Yellow honeysuckle (lonicera flava).—Very pretty; not common.

Liatris.—Three species; very pretty and showy, abounding on prairie during August.

Aster.—Eight species; some of them very pretty, especially the a. lericens, a. levis, and a. novæ Anglice.

Amphyechyris.—When alone looks very pretty, its branches shooting off from stem after the manner of an apple tree; very common here, but not found much east of this.

Boltonia asteroides.—Is very pretty; growing in wet ground; closely resembles an aster; is of a delicate purple and whitish, and faintly salmon-colored; is not found much east of this.

Echinacea purpurea.—A pretty and showy plant, although rather coarse.

Troximon cuspidatum.—A pretty plant, resembling salsify; grows on limestone slopes.

Lobelia.—Three species—all pretty: the l. cardinalis, l. syphilitica, and l. spicata.

Campyloceira leptocarpa.—Rare; very pretty blue; only on limestone slopes; in early summer.

Dodecatheon Meadia—Rare and pretty; on prairie.

Resin Weed (silphium laciniatum).—Is common on prairies; horses are very fond of it; much gum exudes and settles on the stem.

Physostegia Virginiana.—A very pretty plant, with delicate pink flower.

Hydrophyllum Virginicum.—Very pretty.

Polemonium reptans.—Pretty

Phlox divoricata and *p. pilosa.*—Of latter several varieties; white and red of different shades: pretty.

Gentiana.—Three species, g. puberula, g. Andrewsii, and g. alba; the first a very pretty flower.

Asclepias.—Eight species. The a. purfurascens is very pretty.

Indian turnip (Arisaema triphyllum).—Is a pretty plant.

Cypripedium parviflorum, Iris versicolor, sisyrinchuim Bermudiana, polygonatum giganteum, allium reticulatum, scilla Frazeri, lilium canadense, erythronium albidum, uvularia perfoliata and *melanthium Virginicum.*—Are all very pretty plants.

The whahoo (euonymus atropurpures), and bladder nut (staphylea trifolia).—Are both pretty but small trees.

Among trees useful and pretty as ornamental trees, are the elm, linden, red bud, oak, hickory, white maple. Sugar trees occur in the county, but are not common.

I have catalogued about four hundred different species of plants in this county.

Limestone, blue and also gray, is found in good beds for building, in several portions of the county. Three miles east of Pleasant Hill are several quarries of hard blue limestone, in even beds, of twelve to sixteen inches in thickness. A thick bed of very durable silicious limestone occurs one

mile west of Pleasant Hill. There are also good beds of micaceous sandstone in several places. Limestone suitable for making lime is found in most neighborhoods.

Coal, in beds of about a foot in thickness, occurs near Austin, Dayton, and the south part of the county.

The geological formation in this county belongs to the age of the lower part of the upper coal series, and probably include all those rocks belonging to group F, and a part of those of group G, of my Missouri river lecture, as read before the St. Louis academy of science, May 1862, and published in their transactions for 1866.

The following is a section of rocks in the north part of the county:

No. 1. Eight feet; deep blue limestone, with layers of chert.

No. 2. Ten feet slope.

No. 3. One and a half foot; brittle, fine-grained, dove colored limestone.

No. 4. Eight feet; irregularly bedded limestone, blue and buff; lower bed even and good for building; many fossils. This rock is much used for fencing in the north part of the county.

No. 5. One foot; olive shales.

No. 6. Two feet; bituminous shales.

No. 7. Two and a half feet; blue argillaceous shales; fossils in lower part.

No. 8. Four inches; bituminous limestone.

No. 9. Five foot slope.

No. 10. Six feet; coarse gray limestone; upper crumbling; lower part somewhat oolitic; good for building,

No. 11. Ten feet; drab, brittle, cherty limestone.

No. 12. Six feet; thick bedded limestone.

No. 13. Two feet; mostly olive shales.

No. 14. Two feet; bituminous shales.

No. 15. Six inches; clay.

No. 16. One foot; irregularly bedded, fine-grained, pyrilliferous limestone.

No. 17. Two and a half feet; ferruginous limestone; sometimes gray; fucoidal.

No. 18. Thirty-one feet; mostly sand and argillaceous shales.

No. 19. Seventy feet; sandstone and sandy shales.

No. 20. Two feet; drab limestone.

No. 21. Thirty feet; shales; olive and purple; contains one bed of ironstone; few impressions.

No. 3 is easily recognized by its fossils—productus Wabashuxis, pr. punctatus, pr. Rogersii, spifer canuatus, spingera subtilita, and crinoids.

Springs of good water issue from beds between Nos. 5 and 8, and also from No. 15. Below No. 15 springs are exceedingly rare.

The climate is healthy. Doctors can scarcely make a living. Occasionally we have chills and fever, but they are not hard to manage. We have pleasant breezes during the summer, and occasionally fierce, chilly blasts during winter and spring. We rarely have frosts before October, and sometimes only one or two during that month. Our earliest frost this year was about the middle of September, and it was quite severe. Our next frost, the morning of the 22d of October. During last winter we had but little snow; what fell remained on the ground but a short time; but we had some cold weather. and several times the thermometer was below zero. The thermometer rarely ever descends below 10°, but I have known it to fall as low as 20°. We have often here strong winds, peculiar to prairie countries. The summer of 1864 was dry; still good crops of corn were raised; 1865 was a wet season, but good corn crops were raised that year. During the present year there has scarcely been a week without some rain; still, the ground has been in good condition to work nearly all the time, and our crops are generally very good.

CALLAWAY COUNTY.

WILLIAMSBURG, Mo., November 10, 1866.

To Dr. L. D. Moree:

The geographical position of Callaway is E. central in the State. Its whole south border is washed by the Missouri river, comprising a distance of forty miles or upward. The greater portion of the surface of the county is undulating, embracing a variety of soils, adapting it to the

production of all the various products of the state, from hemp, requiring the rich alluvial bottom land, to black-eyed peas, that grow luxuriously on the poorest post oak ridge. Almost a third of the county is prairie land, and nearly every acre of which is susceptible of cultivation. The timber lands, likewise, are for the most part tillable. Such as are not are chiefly covered with fine timber, such as white oak, bur oak, red, black and Spanish oak, white and red elm, and occasionally black walnut, hickory, pin oak, honey locust, and hackberry. Nearly all the land that is too abrupt for cultivation with the plow is reckoned among the best for the growth of the grape; at least the wild succeeds well.

The streams of most importance are Cedar, Aux Vasse, Crow's fork and Whetstone. They are available for water power only a portion of the year. Springs are not very abundant, and the water, most commonly, is hard. For farm purposes cisterns supply domestic wants, and ponds the water for stocks. Streams, cisterns and ponds are universally soft, and wells are uniformly hard. No water surpasses our cistern water in purity. Our subsoil is clay, whose tenacity renders the difficulty very slight in always having an abundance of water for all purposes, even for supplying the requirements of steam mills.

Our timber trees are white, bur, post, red, Spanish, black, pin, water and chinquepin acorn oaks, black and white butternut, walnut, cottonwood, sycamore, linn, basswood, scaly bark, black and white pignut, hickory, slippery and red elm, hackberry, mulberry, pecan, birch, sugar maple, silver leaf maple, wild cherry and honey locust. The smaller trees and shrubs are persimmon or wild date, red bud, sassafras, crab apple, red, hog, sugar and black haw, pawpaw, dogwood, hazelnut, serviceberry, nine bark, Indian arrowwood, etc. The wild fruits are pawpaws, persimmons, grapes, blackberries, raspberries, gooseberries, serviceberries, huckleberries, strawberries, crabapples, and the different varieties of haws, and great abundance of hickorynuts, walnuts, hazelnuts, pecans, and all the varieties of acorns. Many of our wild fruits are scarcely inferior to the cultivated varieties, and bear most abundantly.

There are no government lands in this county, and not much land owned by non-residents or corporations. The average price of improved farms is somewhere between ten ($10) and fifteen dollars ($15) per acre, and unimproved lands between three ($3) and five ($5) dollars per acre. Since the emancipation of the negro almost every land owner has a surplus of land.

Sand and limestone are the prevailing kind of rock. Flint and sand abound in the bed of the streams. Both bituminous and cannel coal largely abound in our county, which but needs capital and energy to develop and render remunerative and largely productive of wealth to the county. In connection with this are beds of iron ore. Some beds of coal are said to be twenty-four feet in thickness. Coal mines have been worked to but a small extent. A coal and iron mining company commenced operations on the river, near Cote San des Seine, shortly previous to the breaking out of the war. But that interest, as well as all others, was destroyed and suspended during the war. There has been no explorations or borings for coal oil that I know of, in this county. There are some fifteen or sixteen grain mills, and perhaps a dozen woolcarding machines.

Labor-saving farm machinery and implements are being introduced to supply the deficiency made by the destruction of serving help, to a large extent. The old McCormack reaping and mowing machine has been used here for years, but it has to give way to the new improved, light draught machine, such as the Ball, Champion, Buckeye and John H. Manny. Vandiver's, Hawarth's, and Brown's are the two-horse corn planters that are used. The Stafford and Buckeye two-horse sulky cultivators are successfully employed in the cultivation of corn. In the way of plows, the Clipper, Peoria, Moline, Quincy, Jewett and Diamond are used; the latter is made at all the smith shops in the country. The Jacksons, near Readville, likewise manufacture double shovel cultivators that can be used double or single, at pleasure, which are highly commended for their efficiency. Husbands have not proved unmindful of the wants of their wives and daughters under the new order of things, in curtailing their labors. Sewing and washing machines are not unfrequent; the Wheeler & Wilson sewing machine is the one most largely used and most popular with the ladies. The Empire, Singer, Wilcox & Gibbs, Grover & Baker, are occasionally met with.

The Johnston, Union, Doty's and Nonpariel washing machines are the principal ones used. The knitting machine is just now being discussed, but it has not been much disseminated. The Dalton, Lamb and Aiken are the candidates for popular favor.

We have an agricultural society, which was organized some ten years ago. During the war it ceased to exist, but now that lovely peace and tranquility reign supreme in our county, it has revived, and is at its wanted duties. The amphitheater, fencing and offices were demolished during the war, but are restored, and the fifth fair of the society will be held October 16th, 17th, 18th and 19th. Those most prominent in inaugurating this society, were C. A. Bailey, Joseph Everhart, Henry Larimore, A. B. Fant, Dan. Tucker, P. B. Reed, William Moore, William Harrison, John

Sampson, Jacob Maddox, and others that I cannot call to mind at present. The present directors are: C. A. Bailey, president; J. N. Bennett, B. S. Bigbee, Wm. Carrington, T. B. Harris, Henry Larimore, John Sampson, D. M. Tucker and Louis Hard. The secretary is J. D. Snedecor, and the treasurer is Zadok Hook. The beneficial results of this society has been the generation of a commendable rivalry among stock growers, in producing finer animals, and importing the best breeds into our midst, and in developing the resources of the soil in yielding larger and heavier crops per acre, and in bringing to the notice of the public the best implements and machinery for farming and mechanical purposes.

I don't suppose there is a tenth part of our county under fence and in cultivation. Our population in 1860 was something over thirteen thousand. Our principal productions are corn, oats, wheat, rye, sorghum, tobacco, live stock—that is, horses, mules, asses, cattle, hogs and sheep—and vegetables, such as potatoes, turnips, cabbage, beets, peas, beans, tomatoes, pumpkins, squashes, etc.

Wheat is a crop that heretofore has not received the care and attention that it deserved. There are but few farmers that bestow the requisite labor in preparing their wheat ground, to bring a full yield. Some of our best farmers make thirty bushels per acre, and will average twenty or twenty-five, while the average of the county would not be more than ten to fifteen bushels per acre. Fall wheat is grown mostly. Subsoiling has not been tried, nor underdraining. The drill has been tried very meagerly.

Corn is *the* crop here. Everybody raises corn, and it grows on all tillable ground. The average yield per acre is forty to fifty bushels. There are no distinctive varieties of corn kept with us. It is known as white or yellow, both yielding equally well. For bread the white is considered much the best, it being more bland and free from peculiarities of taste; for stock the yellow is preferred, on account of its possessing more nutrition. Corn is mostly cut and placed in shocks during the fall, where it stands till fed away in winter, by being spread on the frozen ground. Corn is marketed by being fed to stock, and the stock sent to market.

Rye is one of our most certain crops, and is a great renovator of the soil where run down. Fields alternated with corn and rye continually, it seems to me, would never exhaust. Rye is disposed of by being fed to stock—and a most excellent feed it is—grain and straw, when cut at the proper stage and nicely cured, and saved without injury. Our people have not got far enough along to convert it into villainous whisky, that bane of the world and ruin of so many noble minds. Properly managed, rye will seed itself after the first year, if it be desired to "run" a field in rye for a series of years. It will yield perhaps twenty bushels to the acre.

Oats are largely grown. It is a great exhauster of the soil, but is one of the best articles of feed for stock known. It yields some fifteen to twenty bushels per acre on an average, and fed to stock—not marketed.

Buckwheat grows well, but is not appreciated, and consequently not one farmer in a hundred raises it. Potatoes grow well, but owing to the destructiveness of the potato bug, there is but little encouragement to plant any only the very earliest. We have both the blister, beetle and Colorado bug. Sweet potatoes do remarkably well.

Sorghum is one of the "institutions" here. Everybody raises enough for family use. There are two varieties grown, a black seeded variety and a red. The black is the most productive. Planted early, both are certain crops. That grown on what we call postoak ridges, of third year's cultivation, makes the fairest and best molasses. There has been no effort to make sugar from it. It yields from one to two hundred gallons of molasses per acre; the manner in which it is worked up governing the quantity yielded. Wooden mills and kettles have been used mostly heretofore. Now cast iron mills and Cook's evaporators or boxes are used. Those having evaporators generally work up the cane of a neighborhood, one-half for the other, or at a stipulated price per gallon.

Hemp grows well, but I know of no one that makes a business of raising it. Flax grows well, and many families raise it for home use—nothing else.

Cotton cannot be profitably raised, although some families have raised it for family purposes ever since the county has been settled.

Tobacco is a leading crop grown for market in this county. One thousand pounds, I think, is considered a good average yield per acre; and, to some extent, it is considered an impoverishing crop, but I have had no experience with this product, and shall defer it to those that have. I hope you will hear from Mr. J. B. Crump on the subject, who is abundantly able and well qualified to do the subject full justice.

Sheep, in the aggregate, number pretty large in our county, but there are very few large flocks. Almost every family has a flock of from ten to one hundred head, and the wool is mostly worked up at home—woven by hand looms into jeans, flannel, linsey and blankets, and knit into hose, and disposed of in these forms. There are very few pure breeds of any kind in the county. Some years

ago there were Southdowns, Cotswolds and Spanish merino disseminated through the county, but the rebellion breaking out, all progress in this line was brought to a dead lock. Now the probability is that the dissemination of fine sheep will be resumed again. The only man that I know of who has attempted to keep anything like a large flock of sheep is Mr. William Dishman. He has been eminently successful so far with his sheep. They have been entirely healthy. I cannot see why sheep raising should not be more profitable on the cheap lands of Callaway than they are on the high-priced lands of Ohio. Three gentlemen from Guernsey county, Ohio, Messrs. Nice, Baker and Hurwood, have purchased farms on the Nine Mile prairie, and are stocking them with Spanish merino sheep; so we will soon begin to know whether it will be profitable to carry on sheep husbandry on our cheap lands. Our pastures are almost exclusively blue grass. We have had almost perfect immunity from the depredations of dogs.

Timothy and herd grass, or red top, constitute our meadow grasses. The latter is also good for pasture. A ton of hay is considered a fair average yield per acre. Hungarian grass and millet are grown to considerable extent, and yield perhaps, a ton and a half to two tons per acre, if a favorable season.

Hedging has been tried to some extent. Judge John Yates and my father were the first to experiment with live fencing. They procured "bodark," or Osage orange plants, from Prof. J. B. Turner, of Jacksonville, Illinois, some fourteen years ago. It promised to do so well that many others followed their example. In the course of a few years the lower branches began to die out and leave the hedge open at the ground, and was no protection against hogs. This caused dissatisfaction and discouragement, but for a year or two past the plan of laying the hedge down, by cutting each plant half off at the ground, has been resorted to, which seems to entirely remedy the defect mentioned, and brings the hedge into renewed favor again. The plant is entirely hardy, and is of a very vigorous growth. Timber, as yet, is too plentiful to make hedging a necessity.

Callaway county is decidedly and emphatically a stock growing county. There is a great deal of attention given to the raising of hogs. The Berkshire was introduced here, perhaps, twenty years ago, and, latterly, the Irish grazier. These have been the principal breeds. Of late there has been some inquiry after the Chester white. Thomas and Samuel Harrison, John Yates, Samuel Bryan, Ed. Washington, John Mosby, D. F. Huntington, Samuel Grant and others have, at different periods, contributed to the improvement of hogs. There is no way of which I am aware of arriving even approximately at the number that are slaughtered and driven to market from our county, there being no statistics of any shape or kind kept. The plan with our farmers in regard to hogs is to only feed them one winter, bringing them to the slaughter pen when they are sixteen to eighteen months old, and making them net from two hundred to four hundred pounds. The few that are kept till they are two or three years old are made to weigh from four hundred to six hundred pounds net. Cattle, in like manner, are largely raised, but, as with hogs, there is no way of ascertaining the number. There are yearly hundreds and thousands of beeves sent to the St. Louis market, and there are, too, large numbers of Illinois cattle buyers, every season, who procure large herds of our best cattle to feed. Twenty-six years ago Wallace and James Estill brought the first Durham cattle, that I have knowledge, to this county, and William Hays and William Grant contributed greatly to the distribution of the breed. Of late years Henry Larimore and Charles A. Bailey have been the leading raisers of the improved short-horned breeds. In the north part of the county Frank Harrison and Benjamin D. Yates have done something in that way.

There has been no attention given to the dairy. There is talk, at present, of a gentleman from Ohio establishing a dairy at Fulton.

I will here mention, while on the subject of cattle, that Messrs. Larimore and Bailey almost universally take premiums on their cattle wherever exhibited, even at St. Louis, where, I suppose, almost the finest cattle in the world are brought together. Mr. Larimore has a yearling heifer that has taken, perhaps, a half dozen first premiums (including St. Louis) this fall, and for which he has refused one thousand dollars. He also has several cows and a bull that have met no successful rivals.

The same difficulty is encountered as to the number of horses raised as that of hogs and cattle. Draught horses are principally raised. I suppose the average price of draught horses might be placed at one hundred and fifty dollars. Good saddle and buggy horses would perhaps double that price. Some of the first efforts to improve horses in this county was by the introduction of the copperbottom stock, but it proved deficient in stamina and hardihood. They made very lively, pleasant saddle horses, but not having the requisite powers of endurance, other breeds were brought forward. Richard Barnes and John Sampson brought in the Canadian horse, D. M. Tucker and Jilson Harrison, the Morgan, J. J. P. Johnson, Bellefounder, and Dr. Martien, Chattanooga, all horses of merit. J. J. P. Johnston has had a project on foot to bring here a thorough bred Arabian stallion, directly from Arabia, but I am fearful he will not carry it out.

Jacks and jennets have received special attention, and I surmise that nearly the best selection of that kind of stock can be seen in this county. The raising of mules is a leading interest in our county, and has been for a great many years. Kentucky had to do tribute to us in furnishing many of her best jacks, and Ohio in a like manner, in furnishing us her largest mares, from which to breed. The mule has been a source of large profit to our county. Our market has been the south, mostly, though many Missouri mules have gone west, to California, Oregon, and elsewhere. Last year well-nigh a thousand grown mules were marketed from this county, notwithstanding the depletion and exhaustion, from having to furnish vast numbers of mules during four years of war for the federal armies, and the endless stealing of good mares by marauding rebel outlaws. Mule colts this fall have sold from fifty to one hundred dollars, according to form and size, and older mules in like proportion. A. B. Fant and William Harrison are our most prominent traders in mules, and have been for twenty years. Horse property became so unsafe during the war, that many of our farmers got in the way of using mules in the place of horses, and still keep up the practice, and it is likely to be a fixed habit henceforth.

Our county is not yet so densely populated as to be devoid of charms for the hunter. Wild game still abounds to a considerable extent. A few deer are yet met with, though it takes great shrewdness to bring them down, surprise or capture them. The lover of the chase can also find foxes enough to afford them lively sport. A good many turkeys are to be found; they, too, are pretty shy and wild. Squirrels, hares, quails, and prairie chickens are quite plentiful, and geese are almost innumerable in winter.

I herewith annex the premium list of the fifth annual fair of Callaway county, held at Fulton, on October 16, 17, 18, 19 and 20, 1866.

PREMIUM LIST OF CALLAWAY COUNTY.

ARTICLE EXHIBITED.	EXHIBITOR.	PREMIUM.
Best yarn carpeting	Miss A. Starke	$ 4 00
Best rag carpeting	Mrs. J. Chandler	3 00
Best farmer's jeans	Same	5 00
Best fine jeans	Same	4 00
Best plaid flannel	Mrs. J. Dunevant	3 00
Best white flannel	Mrs. J. Chandler	3 00
Best white linsey	Same	3 00
Best plaid linsey	Mrs. D. W. Craig	3 00
Best pairs homemade blankets	Mrs. J. Sampson	5 00
Best pair homemade linen table cloths	Mrs. J. Chandler	3 00
Best yarn coverlet	Same	3 00
Best pair yarn mittens	Mrs. J. Sampson	1 00
Best worsted quilt	Mrs. J. H. Jamison	3 00
Best calico quilt	Mrs. J. B. McIntire	2 00
Best silk quilt	Mrs. W. H. Curtwright	5 00
Best yarn socks	Mrs. E. J. Powell	1 00
Best yarn hose	Same	1 00
Best one pound flax sewing thread	Mrs. J. Chandler	1 00
Best jeans coat, by a lady	Mrs. W. H. Hook	3 00
Best cotton shirt, linen bosom, made by hand	Mrs. J. Allen	2 00
Best five pounds butter	Mrs. J. Chandler	2 00
Best cooked ham of bacon	Mrs. C. A. Bailey	5 00
Best loaf corn bread	Same	1 00
Best loaf wheat bread	Mrs. B. T. Murray	2 00
Best five pounds honey	Mrs. J. Allen	2 00
Best bushel wheat	J. D. Carson	4 00
Best bushel sweet potatoes	J. Sampson	2 00
Best bushel Irish potatoes	W. H. Hook	1 00
Best bushel apples	H. C. Renoe	1 00
Best six head cabbage	T. Hensley	1 00
Best dozen turnips	W. Y. Parmer	1 00
Best dozen beets	Mrs. S. M. Kerr	1 00
Best one hundred pounds flour	J. Sampson	5 00
Best 5 lbs manufactured leaf tobacco, growth '66.	W. L. Kidwell	10 00
Best five pounds shipping tobacco	W. T. Williams	10 00
Sheep.		
Best fine wool aged buck	J. W. Duncan	5 00
Best fine wool aged ewe	Same	5 00
Best buck lamb	Same	2 00
Best ewe lamb	Same	2 00
Best long wool buck lamb	W. H. Curtis	5 00
Best long wool ewe lamb	J. W. Duncan	5 00
Hogs.		
Best boar, any age	W. H. Curtis	5 00
Best sow, any age	Same	5 00
Thorough Bred Cattle.		
Best four year old bull	Henry Larimore	10 00
Best three year old bull	Same	10 00
Best calf, bull	Same	6 00
Best four year old cow	Same	10 00
Best three year old cow	Same	10 00
Best two year old cow	Same	8 00
Best one year old cow	Same	8 00
Best calf cow	Same	6 00
Grade Cattle.		
Best four year old bull	H. T. Hubbard	10 00
Best two year old bull	T. Hensley	8 00
Best four year old cow	C. A. Bailey	10 00
Best three year old cow	T. Hensley	10 00
Best two year old cow	C. A. Bailey	8 00
Best one year old cow	H. T. Hubbard	8 00
Best calf cow	C. A. Bailey	6 00
Best yoke of oxen	W. H. Trimble	10 00

PREMIUM LIST—CONTINUED.

ARTICLE EXHIBITED.	EXHIBITOR.	PREMIUM.
Fine Horses.		
Best four year old stallion	Levi Dixon	$ 10 00
Best three year old stallion	G. B. Anderson	10 00
Best two year old stallion	T. R. Haden	8 00
Best one year old stallion	W. Carrington	8 00
Best four year old mare	B. S. Bigbee	10 00
Best three year old mare	J. Sampson	10 00
Best two year old mare	Same	8 00
Best one year old mare	S. Kennan	8 00
Best colt mare	L. Carter	6 00
Harness Horses.		
Best four year old stallion	W. H. Jacobs	10 00
Best three year old stallion	G. B. Anderson	10 00
Best two year old stallion	T. R. Haden	8 00
Best one year old stallion	J. P. Thomas	8 00
Best colt stallion	W. Carrington	6 00
Best four year old mare	B. S. Bigbee	10 00
Best three year old mare	John Sampson	10 00
Best two year old mare	J. Chandler	8 00
Best one year old mare	S. Kennon	8 00
Best colt mare	L. Carter	6 00
Best gelding, single harness	R. T. Bass	10 00
Best mare, single harness	B. S. Bigbee	10 00
Best pair horses in harness	S. McCracken	10 00
Best pair mares in harness	B. T. Bigbee	10 00
Best model mare	W. H. Bass	10 00
Draft Horses.		
Best four year old stallion	S. Turner	10 00
Best three year old stallion	J. T. Brown	10 00
Best two year old stallion	J. W. Donahue	8 00
Best one year old stallion	B. Whaley	8 00
Best colt stallion	W. Carrington	6 00
Best four year old mare	W. L. Clatterbuck	10 00
Best three year old mare	J. B. Philips	10 00
Best two year old mare	J. H. Crawson	8 00
Best one year old mare	G. S. Waters	8 00
Best mare colt	J. B. Philips	6 00
Best pair horses	R. Pulis	10 00
Best pair mares	W. S. Austin	10 00
Best gelding for all purposes, three year old	P. S. Holt	10 00
Best two year old gelding for all purposes	W. D. Hume	8 00
Jacks and Jennets.		
Best four year old jack	B. T. Murray	10 00
Best three year old jack	J. Sinclair	10 00
Best two year old jack	T. Wade	8 00
Best one year old jack	O. F. Herndon	8 00
Best jack colt	C. A. Bailey	6 00
Best four year old jennet	J. M. McKim	10 00
Best two year old jennet	Same	8 00
Best jennet colt	Same	6 00
Mules.		
Best four year old horse mule	A. B. Fant	10 00
Best one year old horse mule	C. A. Bailey	8 00
Best colt, horse mule	J. Curry	6 00
Best four year old mare mule	A. B. Fant	10 00
Best three year old mare mule	R. W. Tureman	10 00
Best two year old mare mule	W. H. Bass	8 00
Best one year old mare mule	W. T. Craig	8 00
Best colt, mare mule	B. F. Murray	6 00
Best pair draft mules	H. F. Renoe	10 00
Best saddle mule	D. W. Barnes	10 00
Best pair three year old mules	R. Carter	10 00
Best single mule in harness	H. Shootman	10 00

PREMIUM LIST—CONTINUED.

ARTICLE EXHIBITED.	EXHIBITOR.	PREMIUM.
Saddle Horses.		
Best four year old stallion	J. Windsor	$10 00
Best three year old stallion	J. J. Cox	10 00
Best two year old stallion	S. Glendy	8 00
Best one year old stallion	C. W. Samuel	8 00
Best colt, stallion	W. Hubbard	6 00
Best four year old mare	W. H. Jacobs	10 00
Best three year old mare	H. R. Murray	10 00
Best two year old mare	J. S. Burnham	8 00
Best one year old mare	J. T. Chandler	8 00
Best gelding	W. H. Jacobs	10 00
Sweepstakes.		
Best saddle horse, mare or gelding	S. A. Christian	50 00
Best roadster horse, mare or gelding, in harness	W. H. Bass	50 00
Best horse or mare under saddle	A. R. Murray	50 00
Best stallion, any age	T. R. Haden	50 00
Best mare, any age	W. H. Bass	50 00
Best saddle pony under fourteen hands high	S. McKinney	8 00
Citizens' Premium.		
Best roadster in harness	W. H. Bass	50 00
W. T. Snell's Premium.		
For fastest horse, mare or gelding, under saddle or in harness	S. A. Christian	20 00

Something like $1200 were distributed in premiums by the society, and I learn that their receipts have not fallen short of $3000. The rules of the society require twenty per cent. of the premium offered, as entrance fee, by those not members of the association, and no premium to be awarded in the sweepstake ring unless there were three entries. And no animal that is four years old or over, shall compete for prizes in breeding classes unless they have proved themselves to be breeders. The society labored under many difficulties, and, notwithstanding them, the results of the fair have been highly gratifying.

Orchards have been greatly neglected in the past. The orchards that were first put out were composed almost wholly of seedling trees, and afterward little or no attention given them. The trees grew up perfect masses of thorny brush. A great many of these seedling trees bore most excellent fruit (I refer to apples), and would have been worthy of preservation; but the better the quality of fruit the less hardy seemed to be the tree, or the greater prey to insect enemies; so the better quality of the original seedling fruit has disappeared, and the worthless, which predominated, is all that remains. Seedling peaches have always been of a better quality, though nothing like equal to budded sorts. From time to time orchards of select fruits have been put out, and now many moderately good orchards are to be seen.

This county is most certainly well calculated for successful fruit growing; but so little attention has been given to this calling, that the oldest inhabitants could not assert possitively what varieties will succeed best. The genitan, Vandivere, royal pearmain, golden pippin (Ortley) and fall queen comprise nearly all of the really tried varieties. These do well, but further experience may prove other varieties to be better. Pears, budded peaches and the varieties of sweet cherries are not tested. The Morello, with all the neglect it suffers (it receives nothing else save when the fruit is ripe) is seen almost everywhere thrifty and flourishing. The last year has given a great impetus to the desire to plant fruit trees. Last spring the demand could not be supplied, and the orders to be filled this fall has no precedent in our history. If farmers would bestow the care and attention that they should on their orchards, I doubt not that we would have fruit in abundance in a few years.

There are no vineyards in our county of which I have any knowledge. Some vines are grown by individuals for family uses, and promise very favorably. Mr. James W. Martin has a Concord vine, which, three years from setting, was as perfect an object for admiration as my eyes have ever beheld on the Nine Mile prairie. It was well trained, and perfectly laden with luscious, ripe fruit.

It bore something like a hundred bunches, and every bunch and every berry of every bunch was perfect. What is possible with a single vine, with no extra attention, might be accomplished with a vineyard, where one's whole attention was given to it. The Missouri river bluffs are thought to be well adapted to the growth of the grape vine, and I am informed that Mr. George Husmann, of Hermann, is so well satisfied of the feasibility of vine culture along the bluffs, that he has purchased lands along them in the southeastern portion of the county, near Portland, with the object of establishing vineyards, and proving the practicability of grape growing for vintage beyond conjecture; and he, being a practical and experienced vintner, I have no doubt but that he will succeed to the extent of his hopes.

Mixed farming is altogether the rule with us. Almost every farmer produces everything that conduces to his own wants. He raises his own horses, mules, cattle, sheep, hogs, poultry of all kinds; fruits, grains and vegetables, and even his sirups, sorghum and maple, and maple sugar to some extent; and during the war rye coffee to a very great extent. Domestic manufactures are common to nine-tenths of the families of the county. Some of the homemade fabrics of some of our ingenious housewives are scarcely to be surpassed. The beauty and finish of some of Mrs. E. Smith's (of Fulton) jeans and carpets would attract notice anywhere. Before the war, when good neighborship had not been disturbed with the south, some of the proud planters delighted in having suits made of her handsome home spun and wove jeans, procured through our indegatigable mule trader, Mr. A. B. Fant.

Labor is not plentiful. This county was one of the largest slave holding counties in the State. Since the emancipation, the negro has greatly disappeared. Many left the county entirely, many more congregated at the towns, where disease disseminated their numbers fearfully; many clung to their old master. This latter class (their former owners), in consideration of their faithfulness, are doing what they can to better their condition. Where they can do it, they build them houses on a far portion of their farms, to which the negroes move their families and occupy as tenants. Here they feel that they are free. The proprietor of the farm employs them at stated wages or a stipulated portion of the crop, commonly the latter, so as to make it the negro's interest to make all he can. The farm owner furnishes all the working animals and implements. One-third of all that is produced on the farm is the portion they commonly receive, sometimes more. Their wages by the month range from ten dollars to thirty dollars, by the day from fifty cents to two dollars; their aptness, willingness and ability to perform the labor required governing in all cases. Common white laborers command from one dollar to two dollars per day. Mechanics from two dollars to five dollars, their capacity and workmanship governing. The negroes about towns, as a general thing, are not to be depended on, only for a day or two at a time, as laborers, while on the other hand, those still remaining in the country are pretty fair, average hands. All of them are too much disposed to spend their earnings for comparatively worthless, showy things; and worse than this, too many unprincipled white persons take advantage of this propensity and cheat them out of their money. Their employers, as a general thing, dissuade them from buying anything that is not of real use to them.

Without any invidious comparison, or disparity of this section of our noble state, or any undue laudation of our people, I would here state it as my opinion, that the people of Callaway county, at this time, are as moral, law abiding and tolerant, as any other 13,000 in the State. Churches are convenient to every neighborhood, and educational facilities are well nigh as good as the best in the state. We have Westminster college at Fulton, which would be a pride and an ornament anywhere. The war disturbed its progress and usefulness for a time, but amidst its ravages the college held its course, and now has nearly recovered its former flourishing condition. It has been a normal school, that has sent forth hundreds of qualified teachers. Every school district has its school-house, and no school-house need want, and seldom does, for a good teacher. This college is solely devoted to the education of boys and young men; but the wants of female education are not all neglected. Female seminaries and high schools have kept pace with the demands of the country. We have at this time the Fulton female institute, under the management of Mrs. M. Rootes, located in one of the largest and best buildings for the purpose in the west, where are taught all English branches, modern languages, and fine arts. Special attention is given to Bible instruction, algebra, geometery, chemistry, astronomy, philosophy, rhetoric, composition, history, chronology, mythology, and the health, happiness and moral training of pupils.

Much more might be said of present and prospective advantages to be had and found in our county, but perhaps enough has been said already. I have tried to be as brief as possible, and at the same time I have extended this much more than I expected, and it has also required more labor than I had anticipated; but if it subserves you any useful purpose, I contribute it freely, and if it does not come up to what you required, I have but one palliation to offer, and that is, that this has

been written under the most perplexing circumstances of anything I have ever attempted to do; I have had no one half hour to bestow upon it uninterruptedly.

If it is desirable to have the early history and settlement of our county, I surmise there is no person in our county, male or female, better qualified or possessing more facts regarding it, than Mrs. Winnie N. Kidwell, of Cote San des Seine, Callaway county, Missouri.

Most respectfully yours,

HURON BURT.

WILLIAMSBURG, December 31, 1866.

Dr. L. D. Morse:

DEAR SIR: I have endeavored to comply with your request, by running over my diary and noting such things as related to temperature or moisture, but I fear you will find little that will be subservient to any useful end.

In answer to your circular, I would remark that the general character of the season in the spring was wet, so much so as to retard the pitching of crops very materially. Much of the oat crop was not sown till the middle of April or after. Corn planting was not finished till after the middle of May.

The general temperature of the spring was low. This is ordinarily the case with our excessively wet springs. The summer was unusually dry. Drought did not, however, affect this entire section of country—there were partial rains that passed through, and when a shower once passed, others followed it, thus giving strips of country fair crops. The general temperature of the summer was high. This is ordinarily the case with our excessively dry summers. The first month of autumn was excessively wet—the remainder a happy blending of fair weather and rain. The general temperature of the autumn has been medium, mild as heart could desire—so mild and general that grass was luxuriant until winter, which did not set in till the 10th of December, and no general feeding of stock was required till the middle of the month. The rains of September thoroughly wetted the ground, and the mild temperature following made the grass take a rapid and quick growth. The fruit crop was very light; that bitter, driving wind of February 14th destroyed almost all the peaches that were exposed to its fury. There were a few dozen scattering ones on our prairie; and near Portland, among the river hills, some trees bore fair crops. The apple crop was also very materially injured, and was a very moderate one. Many varieties ceased growing the latter part of the summer, on account of the severity of the drought. After the September rains the autumn weather was so mild as to induce them to take a second growth, which caused them to split and crack open. This caused them to rot badly, and otherwise spoiled them. The varieties the most injured were the rambo, Father Abram, genitan and romanite. Some varieties never grew any more after the rain. The golden pippin (Ortley), and the New York pippin (Ben Davis or Baltimore red) were most affected in this way. A great portion of these wanted flavor—were insipid, and would not mellow. Some never ceased growing, such as Vandivere, Penn, redstreak, and the seedlings generally, and were as large and of as fair quality as usual. All apples that took the second growth and that ceased to grow, were almost worthless, for cider even, not producing more than one gallon per bushel. The drought similarly affected the sorgho, the juice being deficient about one-half. Pears and grapes are cultivated to a very limited extent. I knew of a few fine pears and grapes. The few grapes that I knew of were not affected with blight or rot. The cultivation of fruit is large, greatly on the increase. Many times more fruit trees were put out this season, in this county, than were ever put out before in a season. The putting out of fruit trees almost amounted to a mania. Some of the greatest boors in the land, even, put out fruit trees; and some of our best citizens, who have been living here thirty years, and never had a fruit tree on their premises, are doing likewise.

Crops are extremely light. Corn was not more than one-fourth to one-half of a general average yield; and not much over one-half of last year's yield, and it was considerably under a general average. Wheat yielded tolerably well this year, better than last year, and the quality was most excellent. The oat crop has been rather inferior for several seasons. This year's yield was under an average. There is no barley raised in our county. Hay, owing to so much dry weather, was scarcely half a yield this year, in comparison with last year, and that was not over an average crop. Rye is one of our most certain crops, and scarcely ever fails to be a full average crop every year. And what makes it desirable is its renovating character to the soil, besides being valuable for feed, and furnishing fine winter pasture. Gooseberries and currants were an abundant yield. Where a stand of turnips was secured, the yield has been extraordinary, many weighing eight pounds. Potatoes took a second growth, and were rendered almost unfit for use.

Most respectfully, HURON BURT.

A few weeks ago I received a volume of your agricultural report for the state, from our worthy county representative, Hon. C. A. Bailey. It was so unpretending a looking volume that I was not induced to examine it for some days; but when I did, I found that it contained much useful and valuable matter, and I was much entertained in its perusal. I must congratulate you on your embodiment of so much that is of real, meritorious worth. I will be most happyto receive the forthcoming reports that you speak of. I would like for you to send me a number of the Farmers' Advertiser, the paper that you are thinking of taking editorial charge. I have never met with a number of it. And if you ever visit Calloway county, I shall be most glad to have you pay us a visit.

Since writing the foregoing, in glancing it over, I notice that I said nothing about the red cedar, which makes considerable growth in some portions of the county. It is the only evergreen growth that we have in a state of nature. White pine, Norway spruce and arbor vitæ, are being introduced about the residences to a considerable extent, for ornamental purposes, and are seemingly thriving well. The red cedar is highly prized for posts and rails, planks and paling fence, and gates, and for making buckets, churns, etc. It is also much used for ornamental purposes about residences and our public institutions.

And perhaps it would have been well enough to have mentioned that the Victor cane mill, has given the most perfect satisfaction in working up sorghum. A horizontal mill, also, manufactured by Kingsland & Furguson, is much commended by those who have used them. H. B.

CLARK COUNTY.

BY J. T. CALDWELL.

Since our last report, another twelve-month has elapsed, gliding smooth and swift adown the silvery stream of time, forming another link in that great chain—the past. During the time mentioned, we have fought and won one of the grandest political contests that ever agitated a nation.

Glorious free Missouri now holds out her inviting hands to welcome to her matchless bounds the muscle and mind of every clime. Her star is in the ascendant. Like Banquo's ghost, she will not "down" at the bidding of any "bread and butter brigadier."

In these "piping times of peace," we have almost obliterated the unseemly scars of our late "unpleasantness." (?) Our material interests have increased in a manner unaccountable to any save American minds.

Plodding "John Bull" opens wide his wondering eyes at the apparent elasticity of his juvenile cousin. "Mon amie"—Louis Nap—shrugs his shoulders, and with muttered sac-r-r-r-r-res, wishes Max. and Mexico at the devil.

"Ursa Major," from his magnificent "den" in Russia, nods his approving head, and vouchsafes an appreciating growl; while the "world and all the rest of mankind" stand aghast at the powers, the magnanimity and invincibility of the American nation.

"Revenous a nous moutons." We are not writing a spread eagle leader for the Bungtown Banner, but a report for Clark county. Pardon the slight digression.

Having given an exhaustive report for 1865, we deem it unnecessary to enter largely into details concerning the different subjects to be commented upon. So—sans ceremonie—here goes.

Our towns are building up, business is reviving, farmers are improving, enlarging and beautifying their possessions, setting out ornamental shade and fruit trees; making themselves more comfortable and their homes more attractive.

Our churches and school-houses, that served as places of rendezvous and for hospitals during the war, are being refitted and devoted to their legitimate uses.

Agriculture has received a fresh impetus during the last year. A farmer's club was organized during the fair week. It meets monthly at the county seat, discussing affairs pertinent to agriculture and the mechanic arts.

One beneficial result of the war has been the establishment of a cash system of business. Heretofore everything has been done upon credit, involving the entire community in trouble and turmoil. May we never see its shadow again!

The annual meeting of our agricultural society, took place on the 26th, 27th and 28th, of September. Much interest was manifested. Competition was lively and well sustained. Our own and neighboring counties were well represented; there were also fair delegations from adjoining counties in Iowa and Illinois.

The attendance was more than double that at any previous meeting. The books were opened, and a large amount of stock subscribed and payed for. The grounds have been refitted, new buildings have been erected, and measures taken to render the annual meeting pleasant, attractive and profitable to all concerned.

Altogether, the Clark county agricultural society is an institution worthy of the high consideration of all farmers and mechanics in this and adjacent counties. Our premiums were double the amount of last year, and we hope to further increase them—the patronage of the public enabling us to do so.

The best show of "short-horns," was by I. M. Rowan, Esq., of Scotlan dcounty, Missouri. He exhibited some splendid specimens of "Devon" stock, taking all the premiums on "blooded" cattle. A spirited contest took place in the class of roadster stallions. First premium awarded to Judge Thomas H. Roseberry, of Clark county, for best four year old—a splendid animal—"Kentucky Whip;" dam, Southern Boston. He was favorably mentioned in our last report as a promising three year old. Second premium—same class—was awarded to J. J. Brown, of Lee county, Iowa.

There was a large show of farm horses from different counties and States. First premium to D. S. Miles, of Clark county, for best four year old horse. Second premium to Maj. D. McKee, Clark county.

There was a fine show of mules of all ages and grades. Jack and jennets were exhibited in goodly numbers.

We had a good show of sheep. All the premiums carried off by Dr. A. Clark, of Clark county.

The hog show was fine. Premiums all accorded to Aaron Bechtol, Esq., of Clark county.

Agricultural products—good show—competition lively; all articles on exhibition worthy of a premium.

There was a full show of apples; several exhibitors vieing with each other for the best display. The best variety was conceded to Judge B. P. Hanan, of Clark county.

The halls of the household manufactures were full and competition spirited. The ladies deserve special commendation for their profuse contributions. Our best wish is that they may increase and multiply—muchly.

Mrs. A. Bechtol, of Clark county, fairly won the "horns" in the display of pantry stores.

Domestic manufactures were well represented. H. M. Swasey, of Athens, Clark county, appropriated the lion's share of the premiums. There were several samples of excellent grape, currant, cherry and blackberry wine on exhibition. We know it was excellent, for we tried it.

Best two-horse wagon—Jacob Harrold, of Clark county; best combined cultivator—John Harper, Henry county, Iowa.

First day's trotting match—first premium to J. J. Brown, of Lee county, Iowa; second premium to H. J. King, Clark county. Pacing match—three year olds—first premium to L. T. Wilson, Clark county; second premium to T. A. Roseberry, Clark county. Sweepstake pacing—premium to Wm. Kay, of Lee county, Iowa, four year old gelding "Shanghai," time, 2:35. Ladies' riding match—first premium to Miss E. Pope, Clark county; second premium to Miss S. Meryhew, Clark county; third premium to Miss E. Singleton, Clark county. Best gaited mare or gelding—first premium to F. N. Bartlett's horse, Clark county; second premium to W. S. Brown's mare, Lee county, Iowa. Best saddle stallion—first premium to O. Newberry, Lee county, Iowa. Best trotting to time—first premium to H. J. King's mare, Clark county; time, 2:37. Mule race—first premium to Sam. Neil's mule, of Clark county.

The officers for the current year are: Judge C. W. Meryhew, president; Major David McKee vice president; J. T. Caldwell, treasurer; O. F. Ensign, secretary; C. S. Callihan and A. F. Heely, assistant secretaries; Joseph McCoy, jr., H. M. Hiller, B. P. Hanan, Chas. Horr, Isaac N. Lewis, J. V. H. Bolter, C. O. Sanford, G. R. Harn and Dr. A. Clark, directors.

O. F. Ensign, secretary, closes his annual report by remarking: "Being favored with fine weather, our fair passed off admirably. Our receipts amounted to a sum sufficient to pay off the premiums offered, dollar for dollar, besides a large amount of created miscellaneous premiums, and our society now enters the tenth year of its existence with the most admirable and encouraging prospects."

Timber is abundant; some varieties were stripped by the canker-worm in the month of June. The oaks and hickories are being operated upon by some destructive worm. There are one hundred and sixty acres of government land in the county. Farms and farming lands are changing hands; prices are buoyant and well sustained. There have been some new discoveries of coal, but of no other mineral. In mills some important changes have occurred—to the advantage of the community, we hope. Since our last report C. H. Hirschler has erected and put in operation a large distillery at St. Francisville, affording employment for many workmen, and yielding considerable revenue to the government. There are no foundries in the county; but there is a good opening for

the advantageous employment of capital in this business. In woolen factories some changes noted. No better business offering in the county for capitalists than in this branch. The improved implements, adapted to the necessities of the farming community, are being extensively introduced, giving great satisfaction. This branch of business is improving. Home manufacture seems to be the "main thing" with us.

Fall wheat was almost a failure, owing to its advanced growth and the excessive cold during the latter part of February and first of March. Spring wheat was an average crop. The usual breadth of fall wheat was sown again this season, and generally looks well.

An increased breadth of corn was cultivated. The crop was cut short by frost in September; yield, about forty bushels per acre in the county.

There was a fair yield of rye, though damaged in the shock. Average, twenty-five bushels per acre. Fall sowing was extensive, and is looking well.

The oat crop was fine; harvested in good order; average per acre, forty bushels. Barley, about fifteen bushels per acre.

Sweet potato crop was largely increased, and of excellent quality. The yield of Irish potatoes was not so good as last year. The old and new potato bug troubled all the varieties except the peachblow.

About sorghum enough was raised for home consumption. Some fine samples of sugar have been made in the county in this season.

But little hemp was raised this season—none for shipment; no factory in the county. More flax was raised than formerly—principally grown for seed; yield, about ten bushels per acre.

But little cotton was raised, though with good success.

Considerable tobacco was cultivated—some good, some indifferent.

Sheep raising about an average with last year; some increase in numbers. The disease spoken of last year has disappeared. Some fine wools have been introduced.

We cannot repress the desire to indulge in an indignant "fling" at the "curs of low degree" so multitudinously abundant. We must insist upon the legislature moving in the matter and passing a stringent law to save the state from the losses occasioned by the ravages of worthless curs. Our deliberate verdict is, that it reflects disgracefully upon the moral vim of our sapient and astute law-makers to hesitate a moment in discriminating between the material advantages to be derived from the propagation of sheep or dogs. "Old things should pass away, and all things become new." In the new order of things let sheep take precedence, as between sheep and dogs.

Hay and tame grasses flourished luxuriantly; average yield in excess of former years. Outside pasturage is good up to date (December 2), almost equaling the celebrated "blue grass belt" of Kentucky.

Hedges are looking well; preparations are making to propagate largely next season; a few years more will see us well "hedged in."

Number of hogs greater than last year; breeds improved; cholera (so called) ravaging the county disastrously.

Our herds of cattle are increasing; breeders are looking to their interests by improving their crosses; prices have ruled high up to a recent date; quite a number are being fed this winter in the county.

In horses there is a marked improvement in blood; number increasing, close attention bestowed by breeder.

There are a limited number of jacks and jennets in the county of good characteristics; prices high.

Mules are becoming a "fancy" with some of our producers. We can show as good stock as any county in Missouri.

The canker worm is ravaging the orchards generally; fair crop of apples and of a good quality. Our own orchard alone remains untouched; we applied the remedy spoken of in our last report; we have not patented it yet, and would prefer, for a reasonable compensation, to publish it for the benefit of fruit growers at large. Thousands of trees have been set out this season with good success; orchards have been remunerative, and in our opinion will always be profitable if properly cared for. Pears, fair crop; a number of trees set out this year; standard and dwarf do well in this climate. Peaches, very few raised. Quinces, apricots and plums—fair yield; will be propagated more extensively in future. Cherries—full crop; May duke and British June in excess. Currants, gooseberries, etc., all yield handsomely. Large quantities of excellent wine manufactured during the season.

Vineyards are on the increase. Another year, under favorable auspices, will enable us to vie with some of the older and more favored counties in wine making. Messrs Therme. and Confrey,

near Athens, Clark county, have the most extensive vineyard in the county. They are assiduously employed in the propagation of the grape. Being from the wine district of France, and practical growers withal, we expect much from their efforts. Another season will enable us to judge more intelligently than at present writing. They use eight or ten varieties of grapes in their vineyard.

As time and space limits us, it only devolves upon us to add a few remarks by way of conclusion. We hope to see a fuller list of counties reported this year than appeared in the last "state report."

We have contributed our mite, willingly at least, if not wisely, and shall be ready at all times to assist as best we can, in furthering the agricultural and mechanical interest of our own county and our state at large. Hoping these few hasty sketched paragraphs may meet the approbation of the board, we close with kindest wishes for the success of our state board, our county, our state and our country.

LURAY, MISSOURI, November 26, 1866.

Dr. L. D. Morse:

DEAR SIR: I will give you a few notes of my experience and observations since writing to you last December.

The severe cold of last winter was very hard here on fruit trees and vines. Some apple trees of bearing age were injured in the orchard. Many varieties were injured in the nursery and in young orchards, namely: early harvest, white winter pearmain, sweet romanite or winter sweet, rambo, northern spy, Rhode Island greening and romanstem. Uninjured in nursery or orchard are red June, red astrochan, sweet June or high top sweeting, American summer pearmain, Kirkbridge white, maiden blush, famense, fall pippin, red Vandever, Jonathan, winesap, small romanite, Raules' janet, limber twig, willow twig, Annette, white bellflower or Ortley, yellow bellflower and Hew's Virginia crab. We had a fair crop of apples on the bearing trees in this county, except on a few orchards that were stripped of their leaves by the canker worm or apple tree measuring worm. The canker worm was very bad on some orchards, and apple trees in those orchards looked in June as though a fire had burned through them. I have had none in my orchard yet to do any damage. I have watched for them, and have shaken them from the trees, on their first appearance, then killed them by hand. The tent caterpiller was also very bad, but from its habit of collecting together was more easily destroyed.

Pear trees were more or less injured by the hard winter. Of standards are: Bartlett, badly injured; The young wood generally killed; Beurre d Anjou—a little injured; Madeline—hardly hurt any; Flemish beauty—but little injured; Winter nelis—sound; Hilton's best winter (local name) sound; white doyenne—perfectly sound.

Dwarf pears were much less injured than standards.

Old peach trees were badly injured and all the fruit was killed in the bud early in the winter.

Grape vines of many kinds were injured. Catawba, left up, badly hurt; not a half crop of fruit; Isabella, no fruit scarcely; Clinton, sound, full crop; Concord, sound, full crop; Canby's August, injured, no fruit; Rebecca, nearly killed, no fruit; northern muscadine, sound, full crop. Young vines, all covered, not hurt.

My young Jonas, Israellas, Cassady's, golden Clinton, Roger's hybrid No. 1, Hagar, Allen's hybrid, Adirondac, Herbemont, creveling, Diana, Logan, Catawba, Canby's August, Isabella, Delaware, Hartford prolific, Norton's Virginia seedling, Clinton, northern muscadine and Concord have all grown extra well this year, ripened their wood and have shown no signs of disease.

Plums were not injured by the cold, that I know of or have heard from. We had a full crop of plums where the curculio did not take it. Our only chance for a crop of the finer plums seems to be in planting where the ground will be tramped hard and clean, and a plenty of poultry be allowed to run around the trees to eat up the curculios, which should be jarred down for the poultry once every morning. The native red sloe and its improved descendants, the yellow Oregon, and one or two other varieties, seem to be impervious to the attacks of the curculio.

We had a fine crop of small fruits. Houghton and American seedling gooseberry, very full of fruit. A fine crop of currants. An abundance of wild blackberries. The Lawton is not productive with me.

Wilson's Albany, Hooker and Washington strawberries were very full of fruit, and are generally very hardy and productive here.

Raspberries full, except Brinkle's orange.

I am becoming stronger and stronger in the opinion, as every year's experience is had, that we have a soil and climate in Clark county well adapted to apples, pears, grapes and small fruits. Also for plums, when we can save them from the curculio.

May Missouri, the richest state in the Union in natural advantages, soon be the richest in improvements, arts, the sciences, morality and general intelligence.

B. P. HANAN.

CLINTON COUNTY.

PLATTSBURG, MISSOURI, January 1, 1867.

L. D. Morse, St. Louis, Mo.:

DEAR SIR: I will proceed to answer the interrogatories contained in your communication of December, 1866, as best I can from my own observation.

The seasons, during the year 1866, were about as follows: spring, one of the most delightful we have had for a number of years, very little rain and decidedly favorable for the farming interests. Summer, the early part continued favorable, with occasional showers; about midsummer, a time we needed rains to mature corn and fruits of various kinds, we experienced a drought which materially injured the products above mentioned. The latter part, however, was supplied with refreshing showers, which caused vegetation to revive and brought smiles to the countenances of the farmers. Autumn brought the cheerful sunshine and frequent rains, which afforded one of the most desirable seasons we ever had for taking care of grain and seedtime. Taking the seasons altogether, they were very favorable; for while corn and some other products did not yield as abundant harvests as had been realized at other times, the harvest of wheat, oats, barley and grasses was abundant and amply remunerated the farmer. The temperature of the atmosphere during the whole of the seasons mentioned was not oppressive, seeming to be suited to the peculiar circumstances and wants of the people.

The fruit crop was not very abundant, but sufficient to supply the demand. Apples were more plentiful than any other kind of fruit; no peaches of any consequence, very few pears; and very light crop of grapes. Grapes suffered materially from the blight. The cultivation of fruit is rapidly increasing in our county. Those who have thoroughly tested the culture of grapes have been liberally rewarded; the soil in some localities seems to be well adapted to their production.

I might say that the crops in our county for 1866 will compare favorably with any for a number of years past. The soil in our county seems to be well adapted to almost every kind of vegetables; and the experiment in the culture of any and all, within my observation, has proven successful to the most sanguine expectations.

Very respectfully,

WM. J. BIGERSTAFF.

CRAWFORD COUNTY.

STEELVILLE, Mo., 13th December, 1866.

Dr. L. D. Morse:

DEAR SIR: Your letter, with various inquiries in reference to our county, is duly received and contents noted.

While I feel the importance of the subject of agriculture as sensibly as any one, I fear I am totally incompetent to answer your interrogatories satisfactorily to yourself, and others who might see this.

Since the war, agriculture has been at a low ebb compared with many other districts, and, I regret to say, it never rose to that degree of eminence and respect which its importance so richly

merited. When we consider that it is the underlying pillar to all other trades and vocations—when we know that it is the foundation of prosperity to any country—one must regret its neglect.

Our county is, perhaps, above the average in this part of the state, on account of its being longer settled. The soil, generally, is sandy and strong, and stands wet better than dry weather.

Scattered over the county there is an abundance of water of the best quality. Springs of fair size break up in every direction, and amply supply the wants of man and the stock in the country. The Meramec meanders through the county from south to northeast for a distance of thirty-five miles. The lands on this stream are remarkably fertile, and produce corn, oats, wheat, grass, and in fact every species of crop grown in this country, in great abundance. The lower bottoms frequently overflow, which is damaging more or less, but men who labor are rewarded with paying crops. The Hozzah is another considerable stream running from south to north and emptying into the Meramec in this county. "Cotewah" (Courtois), another considerable stream, rises in Washington county and runs some twelve or fifteen miles in this county, where it empties into the Hozzah, near to its mouth.

On both of these streams are fine lands and excellent mill sites. In fact, there are quite a number of fair mills on both.

A large number of other unimportant streams in the county afford good water power; some of which are, and others will soon be made, subservient to the necessities of the county and will conduce largely to the wealth of the county.

The timber on the streams is oak, of many varieties, elm, sycamore, hickory, ash, hackberry, walnut, sugar maple, and many other species, while the bluffs are covered in many places with fine cedar. While the timber on the water courses mentioned and others is good and merchantable, still the county is not what might be termed well timbered. In the interior the growth is post oak, black oak, white oak, hickory and black jack, but inferior to the same found in many other districts of the state. We have a good deal of land not timbered—that is it is called barren—growing only grass, scrub hickory and scrub post oak.

This land is high, but the soil is good and upon it the finest tobacco is raised. I venture the opinion that experienced, careful tobacco raisers could raise in this county as fine tobacco as can be raised in this or any other state. This land also produces wheat, oats, corn, clover, timothy, etc., but not so abundantly as the river bottoms or the valleys.

The valleys I speak of are peculiar to this and the counties south of us. They are frequently wide, scarcely ever rocky, covered with grass or hazel, with a deep, loose, sandy soil, and generally no definite channel to them. The water, if it accumulates rapidly, washes over the whole ground, but hardly ever so as to do any serious damage; and an ordinary wet spell the water never finds its way out, but sinks.

In the valleys, upon the hills, on the bluffs and in the river bottoms grape vines (wild), of an almost endless variety, spontaneously grow up, flourish, bear and mature their fruit. But for the burning of the woods our supply of grapes from the native vine out of the wild woods would be bountiful every fall. The ordinary wild crab grows almost any and everywhere; and the efforts recently made in growing grapes of the improved kinds is proving entirely successful. Fruit of almost every description grows well, fruits well and matures well.

The minerals discovered in the county are iron, copper, lead and coal. The Meramec iron works, just in the edge of Phelps, is only 11 miles from our county seat. The whole machinery of the iron works there is driven by a spring not surpassed in the state. An immense amount of iron(pig, bar and castings) is made there. Some three hundred hands are employed, and William James, the proprietor, has amassed a great fortune, being a fine business man, and master of his particular business.

Lead is discovered in every part of the county. Valuable mines are being discovered and worked considerably in the northeast corner of the county, and near and between Bourbon and Sullivan stations, on the southwest Pacific railroad. On Cotewah (or Courtois)—before mentioned in this letter—there are valuable mines in operation and flattering prospects. The day is surely near at hand when capital will be invested, and the treasures in lead not only in Courtois, but many other places in this county, be developed. This done, and we will linger no longer as a second rate, but will rise to be looked upon as among the foremost of the counties in the state.

On what is called Yankee branch, about twelve miles south of Steelville, is a field of iron ore, covering thousands of acres of ground, and situate in the midst of excellent timber.

This land is owned by a "New York" company, who, it is said, will soon go to work upon it. Nearer to the county seat, and within four miles of the iron lands described, is an excellent coal bed—that is, as far as it has been developed there is no question but there is coal in vast quantities. The quality taken out, as yet, is not the best, having a large proportion of sulphur. In two miles, and to the east of this coal bed, is an inexhaustible paint mine, said to be, after being wrought, superior to venetian red.

About eight miles south of Steelville, and on a stream called "Crooked creek," there is a large body of land owned by different parties, comprising some three or four thousand acres, upon which the most flattering prospect of lead is found. The discovery is recent, but a great amount of lead, considering the number of hands employed, has been raised, and of a very superior quality.

The indications are, to experienced miners, that there are vast deposits of lead ore which must sooner or later tend greatly to the wealth and prosperity of our county, and also of our state.

To attempt to give you a detailed account of the products, timber, soil, rock, the kind and quality of stock grown, and the general habits, customs and peculiarities of our people, would be to make a failure.

It is certain that in an agricultural point of view, we have many undeveloped susceptibilities. All of us, in almost every way, might vastly improve, and then not be able to claim perfection.

Our people are well disposed to peace, good order, education and religion. We have in Steelville an academy that has told and is telling on our character as a people a good story. Many a young mind, in its crude and native state, has received its polish there. During the wretched years of war that cursed our country, the "Steelville academy" maintained its integrity; and never ceased its good work. To it we owe our now quiet, happy condition, and for it we may justly say to others, southeast Missouri cannot excel it in usefulness.

You will pardon me, Mr. Morse, the more readily when you learn that I am not a farmer, but a lawyer, and the only apology I can offer for this profuse letter is the deep interest I see and feel in agriculture.

Very repectfully, etc.

E. A. SEAY.

DALLAS COUNTY.

Dallas county is one of the southwest Missouri counties; bounded on the north by Hickory and Camden, on the east by Laclede, on the south by Webster and Greene, and on the west by Polk. The southwest branch of the Pacific railroad will run through the southeast corner of this county. All of the western portion of this county is very beautiful prairie. The remainder, or eastern part is undulating or rolling, and well timbered, with very rich soil in the valleys. The Niangua river traverses the entire length of the county from south to north. The water is pure and as clear as crystal. The current of the river is very swift, and many tributaries feed the river at all seasons of the year. Upper Big spring is in section one, township thirty-four, range eighteen. The flow of its waters is tremendous—without a parallel perhaps in the state. It empties into the Niangua with a considerable fall to its mouth, a distance of about one mile and a half. The Sweet Big spring is a curiosity; it is eight miles below the Upper Big spring, some less in size, and empties into the Niangua river after a flow of three-quarters of a mile. No bottom has ever been found to this spring. The water is clear, and at the depth of thirty feet, in the winter, perhaps a thousand fish can be seen playing frantically in the water. When winter's stormy tempests sweep by, these fish can be caught in abundance if the proper efforts are made. The Brown springs are five miles north of the Upper Big spring. The Fowler and Hurst springs are located in section eight, township thirty-six, range eighteen, and afford water in abundance at all times of the year. With the Niangua river and these springs, all of which afford excellent and pure water, no county in the state can excel it for water powers. Any amount of the best prairie valleys in the state are found right here in Dallas county, affording tillable land for corn, wheat, rye, etc.

In this county will be found timber of all kinds, such as the black and white walnut, post oak and white oak, blue and white ash, sycamore, hickory and elm. A considerable amount of government lands are yet in this county. About seventeen thousand acres of lands of this county belong to the southwest Pacific railroad company. The average price of improved land is about six dollars; unimproved, two dollars. Twelve or fifteen thousand acres of the lands of this county belong to non-residents. Lands are low, but on the increase, and every facility and inducement are offered to immigration.

There is any quantity of limestone and sandstone, and a mixture of sand and limestone. All dress very smooth, and when polished are beautiful and valuable for building purposes

Coal has been found, but not worked yet. Lead has been found in various portions of the county, along the borders of the streams, springs and rivulets. No mining has been attempted.

There are several corn and flouring mills, all principally on the Niangua river.

Wagons, plows and hoes are manufactured here. No other manufactories of any kind in progress.

Fifty thousand acres of the lands of this county are improved, and about two hundred and eighty-five thousand three hundred and ten acres unimproved. Population about five thousand.

The principal productions are wheat, corn, oats, rye, timothy and other grasses. There are in the county about one hundred thousand acres of good wheat land. Wheat yields well and is not very easily injured by the winter; but very little spring wheat is raised; fifteen bushels per acre is a very small yield; about twenty to twenty-five is a common yield for wheat. No subsoil plows have been introduced, nor wheat drills. Underdraining has never been tried. I do not think that there is any necessity for it here; in many places underdraining could not be attempted, on account of the stone or rock. Corn is one of the principal productions; the yield is very good, about forty bushels per acre. About five hundred thousand bushels are raised. Oats, rye, buckwheat and potatoes are cultivated to a considerable extent, and the yield is enormous.

Flax and hemp, for home purposes, has been raised in small quantities.

Sorghum is cultivated with success for home use, and in some instances for sale. The wooden mill is used for manufacturing it. Cotton has been grown here since the war, and with proper care yields well.

Tobacco has been cultivated for a number of years for home consumption. The crop is not peculiarly impoverishing to the soil.

Sheep are raised in great numbers; some large flocks; advantages for pasture are good; sheep are very healthy; no injuries incurred by dogs.

Some attention is paid to timothy and other grasses. Hungarian I consider a failure; yields from one and a half to two tons per acre.

Hedging has been tried and does well. I have seen some fences of ten year's standing. It makes a good fence. The plants used are the Osage orange; the winter has no effect on it; with a little attention it makes an excellent fence, but in a county like ours, where timber is plenty, there is no inducement for hedging.

Cattle are driven to market from this county to St. Louis and other markets. Large droves are bought up and driven to Iowa, Illinois, and to other portions of this state, in large droves every year. For a stock growing county, Dallas county cannot be surpassed in the state; the range is good from early spring to late fall. Mules and asses are bought and driven away to other states. Horses are of the common stock. A great effort is being made to improve the breed next spring; the average price is one hundred dollars. I am not prepared to say what amount of horses, cattle, mules and asses are raised in this county annually, but a great number

The people are invariably raising orchards, with unparalleled success. Robert Reynolds has a good nursery, four miles northwest of Buffalo, he is a professional fruit grower. Mr. Reynolds has been in the business a number of years.

Hogs are not as plenty as they might be, having suffered much from the war; consequently, they are generally young, but thrifty.

Let me say, before I conclude, that in Dallas county, with her springs and running brooklets—range for cattle, horses and mules, etc., any person may, with little energy, soon realise a fortune. As a wheat country it cannot be excelled; for fruit of all kinds the world cannot surpass Dallas county. I have seen since I have been in the county some of the finest apples that I have ever seen anywhere. For fruit, wheat and as a stock growing county, Dallas county yields the palm to none. A great portion of our timbered land is the best for fall range. In the timber the grass continues green late in the fall.

To conclude: Our people are loyal to the core—they have seen the effects of war, and know how to be loyal from experience. Dallas can never be ruled by disloyal men, nor by any person that ever had any sympathy for rebellion.

PETER WILSON.

DeKALB COUNTY.

BY A. M. CHESMORE.

DeKalb County, Mo., January 5, 1866.

Dr. L. D. Morse:

Dear Sir: DeKalb county, in the northwestern part of the state, is about twenty-one miles ware, and consists mainly of high rolling prairie, well watered by numerous streams. The soil

is generally a dark rich loam, deep and strong, and well adapted to the purposes of agriculture, producing good crops of all kinds which are adapted to the climate.

The streams are distributed in the different parts of the county in such manner that the whole is well watered, and, with the numerous branches and springs, afford an ample supply of good water in every location, for all purposes. The water is generally soft, except in some parts the presence of lime renders the water in the wells hard; but in no part of the state can purer and sweeter water be found than here. Some of the creeks afford available water power for manufacturing purposes, mills having been erected at different times on them; but at present steam power is generally employed in running the mills, of which we have several in operation, consisting of saw and grist mills and carding machines. Some of our mills manufacture flour, but there are no large flouring mills in this county. The erection of a woolen factory is in contemplation by a party who has the capital and energy to make it a success, and other enterprises are in contemplation which tend to add to the prosperity and advancement of the county. We have manufactories here of nearly every kind to supply the needs of the people. We do our own blacksmithing, make our own wagons, harness and saddles, furniture, tin ware, boots and shoes; build our own houses, in good style, and do many other smaller things in the way of manufacturing, but there is still room for good, enterprising mechanics here.

The borders of our streams are lined with white, black and bur oak, red and white elm, black walnut, hickory, honey locust, hackberry, linden and cottonwood timber, affording a sufficiency for making improvements in the way of buildings, fences, fuel, etc. As a whole, the different parts of the county are unusually well supplied with timber as well as water.

Our wild fruits consist of plums, crabapples, blackberries, strawberries and gooseberries. Wild grapes and hops also grow here. We have but very few tracts of government lands in this county, but much land is owned by non-resident speculators, and by the Hannibal and St. Joseph railroad company, all of which is held at high prices, which tends to deter immigrants from buying those lands; consequently the greater portion of the transactions in land, are for those tracts owned by resident citizens. Notwithstanding the disadvantages we labor under by having our lands so much in the hands of those parties who hold it above the selling prices, we have been having a good immigration to our county since the close of the war, and the land is fast being improved by an energetic class of citizens, many of whom have recently come from eastern states.

Wild lands can be bought at from five to twenty dollars per acre, and improved farms at from eight to fifty dollars per acre. We certainly have as good resources for agriculture as any county in northwest Missouri, and the time is not far distant when we shall see our fine prairies covered with farms and herds of stock, and we, as a county, behind none in this part of the State.

Probably about one — part of our county is under improvement at the present time. Our population numbers about — persons.

The principal productions are corn, wheat, oats, rye, barley, buckwheat, potatoes, hemp, tobacco, sorghum and cotton. Fall wheat is principally sown and yields from twenty to thirty bushels per acre.

Corn yields from thirty to sixty bushels per acre, according as the season is favorable or otherwise, and to the care with which it is cultivated. The yellow corn is considered the most valuable for stock, and is generally fed from the shock. Most of the corn is fed to stock, it being the most profitable as well as the easiest manner of disposing of it. Corn is raised to a greater extent than any other crop; next follow wheat, oats, rye, potatoes and sorghum. The other crops are raised with good success, but on a more limited scale.

Neat cattle, hogs, horses and sheep are easily and cheaply raised, and are a great source of profit to the farmers. Most of the sheep are of common breeds, but there are exceptions in the flocks of Cotswold, Southdown and merinos, either pure or crossed. Several flocks of merinos have lately been introduced. Sheep are very healthy. The diseases to which sheep are usually subject are rare here. Dogs and prairie wolves are the greatest trouble to the sheep-breeder.

Hogs are raised in considerable numbers, and are mostly sold alive and shipped to market at Quincy or Chicago. The weight of hogs is from two to four hundred pounds gross, but some exceptions are found when the weight much exceeds the above statement. Besides the common breeds, the Suffolk, Berkshire, grazier and Woburn breeds have long been known, and recently the Chester whites have been introduced to some extent; it is difficult to judge the numbers. Every farmer raises a few, and some raise from fifty to one hundred each year.

The cattle, like the hogs, are mostly sold alive and driven to market. The numbers are difficult to arrive at. When the assessment for the coming year is completed, such data can easily obtained. Besides the common breeds of cattle, the Durham breed is raised to some extent through the county, and either kept pure or mixed with the common breeds, thus enabling some of our farmers to send a more than ordinary quality of beef to market. When the farmers generally see that good stock can be

raised as cheaply, and sold for much higher prices than the common breeds, they will become alive to the importance of improving their stock, and thus reap a richer harvest for their labor and pains. The dairying breeds are not particularly attended to, there being no large dairying establishment in this county.

The more ordinary breeds of horses are generally raised, although there are some good exceptions. Some effort is being made to improve the breeds, but horse raising does not receive so much attention as this important branch of stock raising is entitled to. The average price of good horses is about one hundred and fifty dollars; ordinary horses bring less, and good ones more.

Mules are also raised to a considerable extent. The remarks on horses will apply here. The prices are much lower than one year ago, consequently there is less interest manifested in raising them. Timothy, red top, and clover grasses are raised to a considerable extent, and an increasing attention is paid to those crops.

Many of our farmers are raising Osage orange hedges, and some already have superior fences of this shrub. So far as properly tried the success has been perfect. The winters do not injure the plants after they are one year old. Those who have tried hedging with orange, and those who have been careful observers, generally are fully convinced that hedging with this plant is the best and cheapest way of securing good and permanent fences.

Some of our farmers have good orchards, but generally there is a neglect (and consequent scarcity) of fruit trees. We have one good nursery in the county, owned by Mr. Hikes, of Stewartsville.

Many of our farmers are waking up with new zeal, and improvements are adopted in many things. Many of our fields are tilled, to a greater or lesser extent, with machinery, and no soil in the world is better adapted to the use of farming machinery than the soil here on our prairies. Sulky plows are taking the place of the old shovels. Reapers are doing away with cradles. Mowers are clicking on every prairie in the proper season, and things generally are assuming a new and improved aspect.

The raising of stock is the most profitable branch of the farmer's occupation, and the greater part of the investigations and labors of our farmers tend finally to that.

One of the greatest drawbacks to our advancement and prosperity, as a county and an agricultural community, is what has already been mentioned, and what is the case with many other counties—the fact that so much of the land is in the hands of those who hold it above selling prices. If this land was thrown upon the market at reasonable selling prices, it would undoubtedly soon be under cultivation, and we, as a county, would be reaping the advantages of having a thickly settled country. Besides the disadvantage referred to above, we have to submit to the fact that the Hannibal and St. Joseph railroad company are exempt from paying any taxes on their lands, and other property owners have to bear all the burdens of taxation. This has indirectly a great influence on our agricultural interest, and many other counties are in the same condition, so that this bears unfavorably upon the agricultural interests of a large portion of the northern part of the state. No one thinks this is right, and the question is often asked: "Is there no remedy?"

Owing to want of time, the report of this county is imperfect, but as it is, it is respectfully submitted.

DeKalb County, Mo., January 5, 1866.

L. D. Morse, Esq:

Sir: In reply to your inquiries in regard to the season, etc., of 1866, I have the pleasure to inform you that the early part of the spring was rather dry and warm, and later, cold and wet. A few of our farmers took advantage of the early favorable weather, and planted their corn; and this early planting generally produced a good crop. Others, who delayed until the change of weather, were late in planting, and almost universally the late planted corn is very light, and much of it was nipped by an early frost in autumn. The latter part of spring and early part of summer was very wet; so much so that but few farmers were able to plow their corn sufficiently to keep the ground free from weeds; consequently, weedy fields and light crops per acre of corn, are often found. The autumn, generally speaking, was very wet. The fruit crop was very light. Orchards are rather scarce, and in none of them was there a good crop to harvest.

Our orchards, many of them, suffered much from the ravages of the canker worm. Besides apples, other fruits are not cultivated to much extent. But few grapes are cultivated. As a general thing fruit growing has not as yet received much attention, but the county is fast filling up with people from other states where the crop is more attended to, and they are generally planting trees, and many of the older inhabitants are giving increased attention to fruit growing; so it may be

safely said that this branch of the farmer's interest is increasing in this county. In order to get the people interested in this, as well as other things, it is necessary to bring it frequently to their notice, and I know of no better way at present, than to secure the general circulation of agricultural and horticultural works among the farmers. The Farmer's Advertiser (two copies of which I have had the pleasure to read, sent, I suppose, by you) is a good paper for the purpose and I wish it might be generally read by our farmers.

We had good crops of winter wheat, hay and oats, wherever sown—rather above the average, and the weather in harvest time was so as to admit of these crops being well secured generally.

The corn crop throughout the county is light, so far as to the number of bushels per acre, but more acres were planted in corn, so there is probably as much if not more corn raised here than last year. The early planted corn is generally good; the late planted is light, and much of it ruined by frost.

I hope this desultory letter may give you more satisfaction than it does me as I read it over. Pressure of work is my excuse. Such as it is, however, I gladly send it, and shall be glad to do anything I can in this way, for I am a farmer (just beginning in this state,) and I want to see everything pertaining to agriculture well attended to, and improving. If the poor manner in which I give the little information I have, suits you, I shall be glad to do all I can at any time for you.

Respectfully yours,

A. M. CHESMORE.

FRANKLIN COUNTY.

BY D. W. WHITNEY.

This county embraces rather less than twenty-four townships, or an area of about eight hundred and sixty square miles, and contains from 25,000 to 27,000 souls.

The general surface must be called hilly, although no part of it so uneven as to make it impossible or inconvenient to cultivate.

The soil is generally clay, with a slight admixture of sand, which, with the addition of vegetable mold, makes the strong and enduring soil for which the county is noted.

The bottoms of the Missouri and other rivers are very rich, being composed mainly of mold, with the washings of clay and sand from the hills.

Besides the Missouri, which forms the northern boundary, there are but two streams—the Meramec and Bourbeuse, which have the least claim to the name of river, although several streams, ordinarily small and which become nearly dry at times, claim that distinction.

The Meramec is a good mill stream, swift and clear, and about a hundred yards wide where it leaves the county, and having been, strangely enough, declared "navigable" by the government. Its immense water power has not been improved, as it will be, not many years hence. Before the southwest branch railroad was built, in time of high water steamboats of moderate size ascended this river to the mines of the county to carry away the smelted copper, iron and lead. It enters the county in section thirteen, township forty, range two west, traversing the county in a northeast direction; leaves it in township forty-three, range two east, or half a mile due south from the depot in Pacific.

The Bourbeuse river is a fine mill stream, though much smaller than the Meramec. It enters near the southwest corner, and flows into the Meramec in section eleven, township forty-two, range one east, or ten miles southwest of Pacific.

There are many creeks, some of them claiming to be rivers, but none are considered good mill streams, except Spring creek (and possibly one or two others), which boils up in the southern part of the county, about four miles from Stanton, on the southwest branch railroad. This stream gets its full volume from the one spring, and is sufficient to drive from two to three pairs of burrs the year round.

Ordinary springs abound, almost every farm having from one to half a dozen. And yet, as people generally build on the highest ground, they are seldom used except for stock watering; cisterns being mostly used for house purposes. And although springs are so plentiful, it is a singular fact that we are almost destitute of spring brooks.

The nature of the soil seems to be such as to absorb the water before it goes many rods, and all traces of streams are soon lost. The water of these springs is very generally hard.

Our timbers are white, black, red, post, chinquepin and pin oaks; hickory, ash, black walnut, butternut, cherry, etc., and on the Missouri and other bottoms, sycamore, cotton and pawpaw abound.

Wild fruits and shrubs are very numerous, and form a subject of no little interest; and to merely give the common name of a few of them is far from doing the subject justice. The most prominent wild fruits are pawpaw, persimmon, crabapple, grapes, blackberries, raspberries, and other berries.

It is impossible to state the quantity of government lands in this county, as the tract-book became deranged during the rebellion, but an approximation sufficiently close can be given. On the first of October, 1865, there were 18,000 acres, and since then 6,000 acres are known to have been entered. The probability is that there are about 10,000 acres. They are located mainly in the southern part of the county. These lands are generally supposed to be rough and rocky; probably on the principle that a thing that can be had for asking, is not worth even that. But as government lands are seldom entered from personal inspection, it is more than probable that a good share of these lands are valuable for farms, and much more will be, a few years hence, as mineral lands, for they mainly lie in the mineral regions of this county. One man, more shrewd than his neighbor, has within the last year and a half, prospected and selected some of these lands, which have proved already to contain a rich deposit of lead, and could be sold to-day for many thousand dollars.

It may not be inappropriate to say, for the benefit of whom it may concern, that two years ago there were in this state about 6,000,000 acres, and there is good reason to believe that there is not a county in the state without government lands, all of which can be had, without money and without price, under the homestead law by the landless thousands, both white and black. About 100,000 acres, unfortunately for the county, belong to non-residents.

It is to be hoped that some member of the legislature will distinguish himself by procuring the passage of a law for a special tax on these lands. In that way Michigan redeemed herself from the nightmare of non-resident lands, after the land mania of 1836.

The average value of the unimproved lands of the county is about five dollars per acre; of the improved, double that. We give below a statement of the valuation of real estate and personal property in Franklin county for the year 1866:

Total number of acres assessed	503,356
Total value of said lands	$3,677,603 00
Average value per acre	7 30½
Total number of town lots assessed	2,924
Total value of said lots	$359,736 00
Average value per lot	123 02½
Total valuation of personal property as per assessment	460,281 00

In Dr. Shumard's able geological report of this county, many localities are mentioned where rock of every desirable kind is deposited in great abundance. Lime rock suited to the manufacture of quick lime, and for building material; also, for hydraulic cement, and another deposit of thin layers with smooth surface for flagging, etc.

This is one of the richest, if not the richest county in minerals in the state, embracing copper, lead and iron. The whole southern part of this county is believed to abound in lead, and to do justice to this interest would require more space than can be devoted to it, and more facts than are within our reach at present. The following very brief account is taken from a private statement by Col. A. W. Maupin, of Union:

"The mineral resources of the county are as yet almost wholly undeveloped. Large amounts of lead ore have been raised from eight different mines located in the southern part of the county, and new leads are of frequent discovery. It is asserted that at the Golconda mine, located five miles east of Union, the yield is 1,000 lbs per day to each man. The following named mines, all of which are located in Franklin county, have produced minerals as follows:

Virginia mine	20,000,000
Mount Hope mine	5,000,000
Hamilton mine	1,000,000
Thomas mine	1,000,000
Harrington mine	1,000,000
Darby mine	1,000,000

"The Excelsior, Peninsula, New Era, Ellett, Ping Bennett's, Clark's, Sitser, Golconda, and Massey mines are rich with ore, and the greater part of them are in successful operation. The ore taken from these mines is the pure galena of the richest quality.

"The eminent geologist, Prof. G. C. Swallow, late state geologist, in his report on the mineral lands of Missouri, classes these mines among the richest in the state, and pronounces the supply inexhaustible."

There are eight steam and seven water flouring mills; five steam and four water saw-mils; one hub and spoke factory; two planing mills; four carding machines; and at Washington—the largest town in the county—there are many shops for making different articles and implements, though they do not come up to what is generally understood by manufactory.

We have no foundry, nor factory for making cloth or agricultural implements.

It is a matter of regret that the county agricultural society, which suspended operations during the rebellion, has not yet been reorganized; but it is to be hoped that not another season will be allowed to pass without a thorough reorganisation. The society had beautiful and ample grounds, and sheds prepared for holding fairs, at Union, the county seat.

A horticultural society was organized last year at Gray's Summit, or an effort made to do so. We wrote to the gentleman in St. Louis who was most prominent in the matter, for information in relation to it, but received no response. There may be other minor societies, but we are not aware of any.

The productions of the county are given about in the order of their money value: Tobacco, wheat, corn, oats, potatoes, barley, rye, buckwheat, sorghum, etc.

The average yield of wheat per acre among the best farmers is about twenty bushels—in the county, say ten. Fall wheat is mostly raised—a white, superior article.

Subsoil plowing has been tried with success. Nearly all the vineyards are planted by subsoiling the grounds. The drill has been tried, to a small extent, with satisfactory results. Underdraining has not been tried that we are aware of.

Corn is very generally raised, with an average yield of thirty-five bushels to the acre, mostly of the large white variety, although it is generally believed that a smaller yellow variety is better for stock. This is evinced by the fact that hogs, horses, and we believe cattle, will invariably choose the yellow when both varieties are presented. Corn is universally fed to stock in the ear, and the most of the crop is disposed of in this way, although a respectable quantity is sent to St. Louis for sale.

The oat crop is very general, both for domestic use and for export; but rye, buckwheat and potatoes are seldom grown, except for home use, and in small quantities.

Barley is raised to some extent to supply local breweries, and for export.

Sorghum is generally grown, though in a small way, for domestic use. A few individuals, however, have given decided attention to it. Dr. Nally, of South Point, year before last, made it a specialty, and raised eighteen or twenty acres, and used one of the most approved iron mills and evaporators of Cincinnati manufacture. The Doctor made the most honest, clear, and thick article that we have seen in the state, and so far as he could retail at home, it was remunerative; but a portion of his crop, which sought a market in St. Louis, coming in competition with a poor article, mainly from Illinois, with which the market was overstocked, the price was not tempting, and the Doctor and others have given up raising it. In a great majority of cases it is ground or compressed in wooden mills and evaporated in pots and kettles of all kinds. No sugar has been made from it to our knowledge.

No hemp, and very little of flax and cotton are raised.

Tobacco is extensively grown, and is considered the great crop of the county for making money. From one to three "barns" are raised on every farm. A barn is invariably built of logs, twenty feet square, and will accommodate a crop of from two and a half to three acres. The varieties grown are yellow and blue Prior and Orinoco. The best "manufacturing" leaf is grown on the hills or ridge land, on new ground. Every successive season the leaf is coarser, and three seasons is considered all that the land will bear profitably. On the river bottoms the best "shipping" leaf is grown; the variety is the same, but the superior strength of the bottom soil causes the plant to grow much more heavy and rank, and it appears to be quite another quality. When the plant is ripe—which is known by a change of color from dark green to a yellow cast—it is cut near the ground with a sharp knife (a blow from a hatchet or the like would injure the leaf). After it is wilted, ten stalks are put onto each stick, which are four feet long. This is done by using what is called a spear—a piece of iron, an acute angle in shape, with a socket—this is put on the end of each "stick," and, as was said, ten stalks strung on each stick, and these placed about eight inches apart on the barn timbers. From 800 to 1,000 sticks can be put in a barn, which is five tiers high. The best mode of curing is by slow firing. After the barn is full, fires are made of green

wood, in trenches in the ground. These fires at first are slow and smouldering, and as the sap is seen to recede from the leaf to the stem, and from the stem to the stalk, the fire is increased, though care is necessary to prevent overheating it, as in that case the flow of sap stops and the leaf turns black. From four to six days are required to complete the curing. Franklin is considered the banner county of the state, both for quantity and quality. As a single item of evidence of this, we refer to the fact that at the tobacco state fair, held last fall in St. Louis, a grower of this county bore off the premium—a massive silver pitcher, and over six dollars a pound on the sale of the premium hogshead. It is a matter of regret that the quality and value of this great interest for a year or two past cannot be given. This crop is not peculiarly impoverishing to the soil—not more so than any heavy crop, and less so than turnips.

Although this is considered a first-class sheep country, wool growing has not, as yet, taken a very high position. There are no large flocks, though nearly all farmers keep (or try to) a few. Very little progress is made in that direction; dogs are the great obstacle to its development. Sheep are very healthy, and the advantages for pasturage are good. If the legislature would pass a law taxing dogs, and thereby create a fund to pay for dog-slaughtered sheep, as Vermont and Minnesota have done, millions would be added to the wealth of the state from this source alone. Representatives of the toiling people—in the language of the Spartan mother, "Take a step forward!"

Some attention is being given to the cultivation of grasses, especially clover, for hay and pasturage, but the benefit to be derived from their cultivation cannot be appreciated until more attention is paid to the dairy business and enriching the soil. The average yield of clover hay to the acre is two and one half tons. Red and white clover, and, in fact, all the grasses seem to be indigenous to this soil. Hence, the certainty and abundance of those crops.

Judge Vitt, of Union, and, probably, others, have experimented a little in hedges, but we are unable to say what conclusions have been arrived at.

It is impossible to say how many hogs are fattened in the county, but, considering how prevalent the opinion is among the farmers that this is quite a pork-making county, we would say next to nothing is done in that line. Very little is done to improve the breed, and still less, if possible, to properly breed from and care for such hogs as they have. Hogs of both sexes and all ages run at large or are herded together, and allowed to breed at any age or season, without any care, and after pigs are dropped they take their chances, which is generally extra hazardous, for it is evident that more than half are eaten or overlaid.

The mode of fattening is very crude, wasteful and comfortless. When hogs are "put up" to fatten, a rail fence is made without any shelter, and in such a place they drag out a miserable existence for three months, wading, sleeping and eating (a part of the time) in the deep, cold mud, never having a particle of any food but corn in the ear, and what is worse than all, in many cases never having drink of any kind. With such heating food as corn, this is cruel, and must retard fattening, and tend strongly to making the pork feverish and unwholesome. The average weight of dressed hogs is two hundred pounds. Where corn is raised so cheaply, hogs breeding so fast as they do, and maturing so early, pork raising could not be otherwise than profitable, if farmers would give the subject ordinary attention. It is to be devoutly hoped that a good breed of hogs, a pig pen, a pig trough, and steaming apparatus for cooking food, may soon be common articles of the farm in the county and state.

The cattle are from fair to middling; now and then a good animal being met with, several persons having made an effort to improve the breed; but carelessness is the bane of cattle as well as hog breeding. Although this must be called a fine grazing region, owing to considerable natural range, but more particularly, as has been said, to the fine growth and yield of all the grasses, cattle raising has not received the attention due to it. No person that we are aware of is breeding especially for the dairy. There are no large dairies, and never can be as long as the present notion prevails relative to milking cows. Calves are kept until a year old, or until the cow has another, conveniently yarded or roped, so that they can be let into the cow at milking time, to answer the double purpose of bringing the cow up and making her give down her milk. In this way calves and half grown cattle are prevented from grazing, and allowed to take half the milk, to the great disturbance of that operation, and destructive of anything like dairy business. If cattle raising is the object, it may be best for calves to have all the milk, but if butter and cheese are to be made, they must not have all.

There are some good horses raised in the county, and probably before the rebellion there was more well directed effort than there has been since. The stock, generally, is of an ordinary grade for farm business, owing, no doubt, to the fact that the roads, especially since the war began, have been allowed to assume a condition which would give little encouragement to breeding fast stock either for the saddle or harness. The average price is about one hundred dollars.

Mules are in common use for all kinds of labor, especially by people from Virginia and other southern states, and generally command a higher price than horses. A yearling brings from seventy-five dollars to one hundred dollars, and an average price for a pair able to work is two hundred and fifty dollars.

Too much can hardly be said of this county as a fruit region. The old settlers have hitherto had no inclination, as a general rule, to plant orchards to any considerable extent, but have been content to plant a few apples and seedling peaches irregularly about the house, for family use; but within the last two years a great change has taken place. The new comers generally look for fruit farms, and the old settlers have taken the hint, and are planting and preparing to plant quite extensively. This is their true policy, with a superabundance of land and the loss of their slave labor. A gentleman who has lived on the Missouri bluff for many years, says there has only been one total and two partial failures of the peach crop in forty-two years. Further from the river there have been more failures, although a total loss anywhere is rare. It is to be hoped that fruit growing of all kinds will become more general, year by year, as there is no danger of overstocking the market with our rapidly increasing population.

Grape growing is receiving its full share of attention, and is mainly done by our German citizens. There are moderate vineyards here and there through the county, but they are mostly in and around Washington, South Point, etc. The great majority now bearing is the Catawba, but that variety has not given satisfaction for a few years, and is being entirely supplanted by Concord, Norton's Virginia, Hartford and other sorts. It is a matter of regret that justice cannot be done to this subject in this report, and the names of the principal growers given.

As to roads, there are three under contract—one from Washington to Union, ten miles long, and is all graded, sixteen feet wide, and about one-half macadamized. It will be completed by next spring. Probable cost, $40,000. One from St. Louis county line through the center of this county, now under contract as far as Union, twenty-two and one-half miles long, and sixteen feet wide. The heaviest grading on the road, near the St. Louis county line, at Gray's Summit, and near Union, has been already performed. These parts are macadamized. Some other parts are also graded. It will be completed during the year 1867, as per contract. Estimated cost, $100,000. One from Union to southern part of county. Not much of this has yet been done. One-half mile, from Union to Bourbeuse river, is, however, completed, at a cost of $2700, and the other half mile, through Bourbeuse bottom, has been graded and filled in; also, on the same road, from St. Clair to Meramec bridge, one mile more has been graded and graveled. South of Meramec bridge there are two and a half miles graded through Mount Hope mines. Probably $10,000 have been expended already on this road.

Of bridges we have: 1. One across the Meramec river. This is a truss-arch bridge and covered, with a double roadway, one hundred and eighty feet span. It is nearly completed, and will cost $21,500. 2. One near Washington, on the road to Union; an arch, brick bridge, sixteen feet span; completed; cost, $1700. 3. One near Union, on same road, a wooden bridge, with stone abutments; span, thirty feet; completed; cost, $600. 4. One near Union, on the St. Clair road; a stone arch; span, eighty feet; completed; cost, $200. (?) 5. One near Union, on the St. Louis road; same kind as No. 3; span, forty feet; cost, $800; will be finished soon. 6. One in the southeast part of the county; same kind as No. 3; span, thirty feet; cost, $600; completed. 7. One near South Point; same kind as No. 3; span, thirty feet; cost, $600; nearly completed. Besides the following under contract: One at Berger station, over Berger creek; to be built of wood, with stone abutment and covered; span, 60 feet; to cost $1500. One over Boeff creek, on the road from Washington to New Haven; same kind of bridge as the other; eighty feet span; to cost $2100.

Although this report is very defective, and is so far from doing the county justice, it will nevertheless plainly appear that this is one of the first counties in the state, in every respect, and only needs development.

Statistics have never been gathered until the present season, and now only of live stock. And although every effort was made, they could not be obtained in time for this work; and we venture the hope and belief that, by another year, the same or abler hands will have more time and a greater amount of material within reach, and that a more able and more perfect report will be the result.

GASCONADE COUNTY.

HERMANN, Mo., December 29, 1866.

L. D. Morse, Esq:

DEAR SIR: In reply to your circular I have to say, regarding the general character of the season, I would respectfully refer you to Mr. Bergersdorf, of Boeff, Franklin county, Mo.

Fruit crops have been very small. Apples about a half, pears one-half, peaches one-tenth and grapes three-quarters of a crop. Grapes are cultivated to some extent in this region; they did not suffer much from blight and very little from rot this season. Concord yielded a full crop; but a great number of vines of the Catawba, Norton's Virginia seedling, Herbemont, etc., were injured and many destroyed by the wet summer of 1865, causing the roots to rot, therefore could not yield a full crop this season. The total product of vineyards in this county is about fifty thousand gallons of wine and about forty thousand dollars' worth of plants. The cultivation of fruit, for which this part of the county is so well adapted, is rapidly increasing.

Wheat yielded an average crop; corn, about three-quarters; oats, an average crop; and barley, about one-quarter of an average crop.

Respectfully,

WM. C. BAING.

GREENE COUNTY.

BY M. J. HUBBLE.

Dr. L. D. Morse:

SIR: Owing to circumstances over which I had no control, my report for this county must be limited strictly to the questions propounded in your circular. Our county lies upon the top of the mountain range known as "Ozark moutains;" said mountains are almost mythical, being simply the dividing ridge between the waters of the Mississippi and Missouri rivers. On the farm of N. Massey, Esq., four miles east of Springfield, there is a horse-pond some twenty rods long, in which, during wet weather, springs spout up and overflow it at each end; the water from the north end runs into the Osage, which empties into the Missouri; that from the south end into White river, emptying into the Mississippi.

Our county has a length of twenty-four miles from east to west, and breadth of twenty-two miles from north to south; about two-thirds of it is covered with timber, one-half of which is hilly and comparatively stony. The stony land, when taken care of, makes splendid pasturage for all kinds of stock, but more especially for sheep. The other half of the timber land is composed of rich alluvial bottoms, and what is termed post oak flats and hickory barrens, where is raised the finest tobacco in the world. The bottoms lie upon James' fork of White river, Sac, Pomme de Terre, Wilson, Pearson, Clear creek, Pickerel, Asher and other minor streams.

The other third of the county is prairie, of which we have the Kickapoo, Robinson, Leper, Whitenberg and Grand, all of which are susceptible of cultivation; they are gently undulating, rich and productive, returning the farmer a generous harvest for his care. We have no rivers proper; our streams are those mentioned above. Their respective widths are: James, forty yards: Sac, twenty yards; Pomme de Terre and all others, less—some as narrow as ten yards. Of springs, we have them "too numerous to mention." The spring at "Jones' mill" has been turning a large mill-wheel for "lo! these many years." Also, McCracken's and Frelbright's. Our springs are durable and pure as crystal, and we have enough to spare. Our water is nearly all hard, and the average velocity of the streams is supposed by most men to be five miles per hour, but I think it more—at least seven. For manufacturing purposes we certainly are unrivaled, having no less than twenty-five good sites on our several streams.

Timber was abundant and good, consisting of oaks of all varieties, except the live oak, walnut, wild cherry, hickory, mulberry, red bud, linn or basswood, hackberry, sycamore, sugar maple and ash, and, within thirty miles, pine in abundance. Our undergrowth is hawthorn (?), hazel, sumach, pawpaw and dogwood.

Our wild fruits are plums, crab apples, all varieties of wild grapes in abundance, growing with the wildest luxuriance, gooseberries, strawberries, blackberries, raspberries, dewberries, whortleberries, service-berries, haws, hickory nuts, walnuts and hazel nuts.

We have in our county, subject to entry at government price, about twenty thousand acres of land; and there is still vacant and belonging to the southwest Pacific road, over one hundred thousand acres of as good land as there is in the world, susceptible of the highest cultivation; and before the war covered with countless herds of cattle, horses, sheep, mules and hogs, thereby furnishing to the thoughtful farmer luxuriant pasturage (without the trouble of fencing) during the months of May, June, July, August, September, October and November—seven months of the year. This land cannot be sold by the railroad company until the railroad is completed within twenty miles of it. There is but little land owned by non-residents or corporations. The average price of improved farms in the county may be set down at twenty dollars per acre; of unimproved, at seven dollars per acre.

All have flint, cotton-rock, limestone and sandstone; limestone in abundance, with flint, on the prairies and in the bottoms of the streams. Coal was found just before the war by a farmer named Harrington, about eight miles from Springfield, a sample of which I saw myself; but during the war he died, and with his death all knowledge of the mine was lost. We have iron and lead both, in the county, and many years ago there was considerable lead taken out of a mine on the land of Hon. John S. Phelps. It was worked in a very rude way, but paid the men who worked it. It is said, by those who are competent judges, that coal oil exists on the brakes of the "James," but as yet no experiments have been made.

Agricultural implements are used with eminent success. We now have in successful operation, gang-plows, sulky cultivators, horse or sulky rake, mowers and reapers, stacking-forks, wheat-drills, and corn planters. Next year we will have four or five times as many as we have ever had. We also have threshing machines and corn shellers. We have one agricultural implement manufactory located in Springfield (our county town), and doing well. It is owned and operated by Messrs. George Piper and Norberry, all practical men, who have a patent plow of their own—a double shovel—that is in great favor with our farmers. We have eighteen flouring mills in successful operation. We have in cultivation in our county about one hundred thousand acres, which is about one-fourth of the county. The population of our county in 1864 was thirteen thousand eight hundred and ninety-nine; but it is now greatly increased by immigration and by old citizens returning who had left during the war, and I do not think it an overestimate to place our population at seventeen or eighteen thousand. Our principal productions are wheat, corn, oats, barley, rye, tobacco, buckwheat, potatoes, sorghum, flax, hay, and tame grapes; and here I would remark that this country will produce as fine blue grass as the celebrated blue grass regions of Kentucky; and clover does as well here as anywhere I have seen it tried. Among the best farmers, the average yield of wheat is over thirty-five bushels per acre, the wheat often weighing sixty-four pounds per bushel; average yield in the county about fifteen bushels. We raise the May, Walker, and a red wheat that I do not know the name of; and now that the wheat drill is coming into use, I feel sure our average yield will be over twenty bushels per acre. Our best wheat land is what we call hickory barrens and postoak flats. There has been no subsoiling done in this county, to my knowledge; neither has there been any underdraining; in fact, we have but very few acres in the county that need it. Our soil is of such a nature that it absorbs the water; so that we have but little mud even in winter. In 1860 there were raised in this county 130,798 bushels of wheat, and I suppose there was last year raised as much. Corn is our great crop, and to it the farmer turns his attention more than to any other; to it everything else is made subservient. In 1860 we raised 1,128,396 bushels; and I know there is a greater breadth planted this year than then. I do not know the names of the different varieties of white and yellow corn grown in the county, but I do know that the yellow is best for stock, as it is stronger and contains more of fattening matter than the white. It is fed almost entirely in the ear and as stock fodder. We cut while the stalk and blade are green, and feed in that manner when dry. We have no market for corn, consequently it is fed to our hogs, sheep, horses, mules, cattle, etc., and in this way we save all our manure, besides getting a better price for our corn than if we had to ship and sell. The average yield per acre, say for ten years, would not be less than forty bushels per acre. The average yield of rye per acre is thirty bushels, and we raise about 10,000 bushels per annum; and every farmer likes it. We raise the white rye entirely. It is marketed as corn through young stock. The average yield of oats is about forty bushels. All varieties raised; and our crop will average 250,000 bushels per annum. Barley and buckwheat are raised to a small extent, the former yielding about twenty, and the latter twenty-five bushels per acre. Potatoes seem to be indigenous to the country, and grow for the careful farmer with a luxuriance that would "gladden the heart of an anchorite," yielding from fifty to four hundred bushels per acre. The peach blows and neshannocks are best suited to our soil. Sorghum is grown

to such an extent that it has taken the place, and almost entirely supplanted the sugar house molasses. I am not sufficiently acquainted with the different varieties (never having grown any) to give the names. It is manufactured by grinding in mills and with Cook's evaporator. I know but little about it, except that it does well, and that farmers prefer a red clay soil for it. Hemp is not cultivated here, for we are too far from market; but I have seen it grow wild ten and fifteen feet high. Cotton and flax are cultivated to a small extent, but only for the fiber. Flax does well.

Tobacco is grown here of a finer quality than ever I have seen anywhere, and we have one manufactory here that has always taken the premium wherever they have shown their tobacco; and I say, without fear of successful contradiction, that they make the best chewing tobacco in the world, and the reason is because they get the finest leaf to make it from. There is no crop in our county that pays so well to the experienced farmer as tobacco. The average yield is 1200 pounds per acre, nearly all fine quality, and all manufactured and used at home, readily bringing twenty-five per cent. more than the best foreign tobacco. Messrs. Caynor & Co. estimate the crop for this year at 150,000 pounds. It is considered by our best farmers that tobacco quickly exhausts that part of the soil requisite for its own production, but if crops are rotated—say sown to wheat, which grows best after it—that the land is easily kept in good heart. It is mostly cured in houses, but almost every farmer has his own method for curing.

It is claimed by large flock-masters and men, too, who have spent their whole lives in the business, that southwest Missouri is the sheep country par excellence; vide the reports to the commissioner of agriculture. Mr. Samuel P. Boardman, of Lincoln, Logan county, Illinois, says: "Until I learned differently I would not have supposed that the Ozark mountains, which were platted so plainly across southwest Missouri in my school atlas, and which used to loom up in my imagination as loftily as the Alleghany or Rocky mountains, were merely very high table lands, mostly prairie. Twelve miles southwest of Springfield, Missouri (our county town), within five miles of the now famous Wilson's creek, is said to be the summit of the Ozarks, and is one of the finest of rolling prairies. Flock-masters of Illinois have had their eyes on this part of Missouri for some years, and now that the people of Missouri seem to be in favor of instituting free labor among them, I expect to see, should such be her good fortune, her prairies dotted with thousands of merino sheep. When Missouri becomes a free state, no longer will the finest sheep walks in the most genial climate of our country go begging." I might go on with extracts, but consider this sufficient. The above extract is taken from page 286, agricultural report for 1862. The flocks that have recently come into this county are owned as follows: By Mr. Rex, 2,700; Mr. Egnor, 400; Mr. ——, 800; Mr. Lewis, 1,200, and Mr. Edwards, 200; they are all grade or pure merinos, and there are now in the county about 6,000 head, and we shall, in all probability, have 25,000 pounds of wool as the result of our next clip. These gentlemen have brought some very fine bucks with them, especially one of Mr. Rex's, whose clip last year, at a yearling, weighed twenty-one and a half pounds. It will be seen by this that southwest Missouri's verdant fields and pure water is being appreciated by the flock-masters of the older states. Sheep will do well on the prairie grass, except in December, January, February and March. I have never seen a sick sheep in southwest Missouri. The wool remains, so far, as fine as when brought here. Very little injury is incurred by dogs.

Almost every farmer has his meadow of timothy. Very little attention is paid to tame grasses, as the wild grass suffices; it being liberally interspersed with blue grass, which is gradually but surely supplanting the wild grass on our prairies. Timothy does well here, the average yield in the county being about one and a half tons per acre.

Hedging has been tried, weighed in the scales, and not found wanting, There are hundreds of miles in this county. It was commenced about ten years ago. The Osage orange or bois d'arc is the plant used; it does well both winter and summer, and every farmer believes it the best fence he can have, especially during a war.

Of hogs our farmers now have but few, comparatively, to what we had before the war; perhaps 30,000 will cover all in the county. Their average weight will be about 200 pounds, at one to one and a half year old.

Since the war begun, our cattle have somewhat deteriorated in quality, and we have lost largely in quantity. The value of our live stock in 1861 was over one million of dollars, and consisted in part of 5,469 horses; asses and mules, 2,032; milch cows, 4,405; work oxen, 3,136; other cattle, 8,875; sheep, 16,094; swine, 28,071. Great care is taken by our farmers in raising mares and horses, the average price of which is one hundred and fifty dollars. The mules are marketed in the south, and bring an average of one hundred and fifty dollars.

There is scarcely a farm in the county but what has its orchard, and a great many have a few grape vines, and, as they grow for the planting almost, they are a source of great luxury to the farmer; and as I have given you the names of Messrs. McCracken and Vaughn & Co., who are practical fruit growers and vintners, I will not enlarge upon this point, and only say, this is the best

fruit country in the world for apples, pears, etc., and can only be beaten by the Arkansas river valley for peaches.

On Saturday, June 16, 1855, the Greene county agricultural and mechanical association was organized by the election of Marcus Boyd, president, C. Caanfex and H. S. Chenoweth, vice presidents; C. Sheppard, secretary, and J. W. D. L. F. Mack, treasurer, L. A. Rountree, John Lair, R. B. Weaver, H. Mullings, J. A. Alexander and others, directors. At this meeting, Thomas C. Rainey was secretary. In the year 1856 the Greene county agricultural and mechanical association was merged into the southwest district association, according to an act of the general assembly of the state, without a change of officers. There was one fair held under the auspices of the old association. In 1856 the new one bought grounds and had them fitted up, and their fair in the fall of 1857 was a decided success. The third fair was held in 1858, and was largely attended, and a great many entries made of fine horses, asses and mules, cattle, sheep, hogs, etc. At the annual election, T. G. Newbill was elected president; Messrs. Campbell, Hollis, Hooker, Dudly, Hoyl, Ranis, Shackelford, Haden, Horton and Hancock, directors; C. Sheppard, secretary, and Mr. Mack treasurer. The association, finding that their fair grounds were too small, disposed of the same and purchased ten acres of beautiful land, and proceeded to erect the necessary buildings and stalls, and in the fall of 1859 held a fair at their fair grounds, where a great many fine horses, cattle, etc., were exhibited, and premiums to the amount of fifteen hundred dollars distributed. The southwest district agricultural and mechanical association was then merged into a joint stock company, and as such held a fair in the fall of 1860, which was eminently successful. A large amount of money was awarded as premiums, and the quantity of stock and articles exhibited exceeded all comparison with any of the previous fairs. The marked improvement in all kinds of stock was a subject of congratulation with the farmers, and our fair was looked upon as a permanent institution; but L'homme propose, et Dieu dispose. The war came with its troubles, blasting our hopes and taking away our substance, desolating our land, leaving nothing but a blackened chimney to mark the spot that was once the happy home of a cheerful, thriving farmer, and standing alone as a silent monument of war's ravages and destruction. Since the war, our society has been in a torpid condition; all the buildings and fences destroyed that were once on the grounds. The names of the present officers are General C. B. Holland, president; C. Sheppard, secretary; and J. W. D. L. F. Mack, treasurer; L. A. Rountree, C. A. Haden, T. J. Whitlock, T. J. Bailey, M. J. Hubble, W. H. Graves, of Greene county, T. W. Cunningham, of Polk county, Alfred Case, of Laclede county, Green Wharton, of Webster county, and James M. Moore, of Lawrence county, are directors, and we propose to reorganize and hold a fair next fall.

And now, having answered all your questions in as perfect a manner as my limited time and means of information will permit, I will close by saying that nothing has been overestimated, but I have, where any doubt existed, been careful to under rather than overestimate; and, further, that we have the best water, soil, climate and timber combined it has ever been my lot to see, except in the Cherokee country, and I have been in almost every state in the Union. I have seen better of each, except water, many times, but never all combined, with the single exception above mentioned; and now, after having lived almost a third of a century, I can truly say to the young man who has energy and brains, come to southwest Missouri, for it is your interest to do it. Here you will find steady employment, cheap lands that are good lands, and a pleasant country to live in. At this writing (23d November) the ground has been frozen but once, slightly. Our beautiful prairies invite you with smiling faces to touch their bosoms, however gently, and they will pour out their hidden treasures with lavish generosity. The heads of families have the same advantages, as well as good schools, taught by intelligent teachers, and close to your doors. To the diseased, I would say that we have less wet weather than almost anywhere else, less than two inches of water having fallen in the month of January.

GENTRY COUNTY.

ALBANY, January 1, 1867

Lt. L. D. Morse:

DEAR SIR: In answer to your interrogatories, I have the honor to report the following facts in regard to the condition of agriculture in this county:

The last spring was very wet, so much so that we were only able to cultivate a portion of our land. The summer was dry, and the fall seasonable and warm, with the exception of three or four days during the equinox, at which time we were visited by heavy frosts. We had no severe thunder-storms. The winter, thus far, has been moderate and dry, except one snowstorm.

But little fruit was raised. The apple crop yielded only about a half crop. We have raised no peaches for the last ten years, in consequence of the extreme cold weather having killed the trees. Grapes are just being introduced. Several attempts have been made to cultivate them, but the winter kills them if left exposed. The cultivation of fruit is increasing rapidly.

Corn did not yield over one-half a crop. The weather was too wet and then too dry. Wheat was as good as any crop during the last ten years. Oats were good. Barley was poor; none raised. Hay was good; more than an average crop. Potatoes suffered by the drought. There was not a half crop. We had a good mast of oak and hickory, with which we fattened our hogs.

Red clover grows luxuriantly, and stands the winter better here than in the east, on the clay land. We had a short timothy crop.

The county abounds with wild fruit, such as crab apples, plums, cherries, grapes, blackberries, raspberries, strawberries and gooseberries, the latter as good as the best English gooseberry, and the blackberry as good as the famous Lawton.

Yours, respectfully, G. W. NEEDELS.

GRUNDY COUNTY.

Dr. L. D. Morse:

DEAR SIR: Grundy county is situated in the center of the fertile region of the Grand river valley; the southern line of the county is sixty miles north of the Missouri river; Mercer county lies between this county and the Iowa line on the north; the county is twenty by twenty-one miles square.

A line running north and south, and dividing the county into two equal halves, if prolonged twelve miles beyond the southern line of the county, intersects the Hannibal and St. Jo. railroad at Chillicothe.

This town being the commercial emporium for the fertile region of the Grand river country, extending as it does, far up into Iowa, there is a great amount of transportation and travel in this direction, the principal thoroughfare for which lies upon the line above mentioned.

The surface of the county is divided by altitude into but two grades: first, the high or rolling lands, which embrace about 7-10 of the total area of the county, and whose average altitude is twenty feet above the surface of the water in the streams hereafter to be mentioned. All of the high lands are arable and free from incumbering rocks or stones upon the surface; second, the low lands in contradistinction from the first class or high lands, embrace all of the remaining territory of the county, and are situated between the highlands and the streams hereinafter to be mentioned, and vary in width from one-half to two miles, and streches out to indefinite lengths on one or both sides of the principal streams of water.

Although much of the low lands are arable, and all might with little difficulty be made so, yet there is but a small quantity in cultivation. Three-eighths of the surface of the county is timber—five-eighths prairie.

The arable lands, except the white oak timber land, is a sandy loam, consisting of sand, six-tenths; clay earth, three-tenths; humus, one-tenth. I had intended to have made an anaysis of the soil to be incorporated in this report, but for want of time I am compelled to omit doing so. I will, however, send it at as early a day as practicable, as an appendix to this paper.

There are three varieties of soil in this county, in a sufficient quantity each to be worthy of mention, namely: First, 75-100 sandy loam, which is the soil of our high land prairie, and the borders of much of our timber land, and also, some of low land prairies; second, 5-100 of what is generally known as white oak timber land; third, 10-100 of what is generally known as alluvial lands (there being probably less of the third variety than is here mentioned); fourth, the remaining portion is marly, argillaceous and peaty. They are in small, isolated plats, however, and I have not been able to make sufficient inquiry to enable me to give their probable quantities relative to the whole amount.

In traversing the county from east to west, the surface of the country presents a pleasing view to the eye; the main ridges which separate the streams, and which have an average width of two and a half miles, exclusive of the low lands which border them, running as they do, north and south, and entirely across the county, having their eastern and western slopes more or less deeply carved by hollows, whose widening mouths seem to spread themselves out upon the lowlands, thereby giving the highlands ample drainage, and the lowlands a sufficiency of humidity.

The northern third of the county is more sharply broken and somewhat better timbered than the southern and middle portions.

We have a large number of streams. The west fork of Grand river enters the county at its northwest corner, and, bearing in a southerly direction, connects with the east fork of Grand river at a point midway of the county, north and south, and seven miles from the west line of the county. The east fork of Grand river enters the county seven and a half miles east of the northwest corner of the county, and runs almost directly south; it connects with the west fork at the point above described; the combined current, then running south, crosses the southern line of the county at a point seven miles east of the southwest corner of the county.

This stream has an average width of one hundred feet from the point where it passes out of the county to the confluence of its two branches, a distance of ten miles; average depth of the same in the center of the current, five feet; velocity of current, two miles per hour; fall, one and a half feet to the mile. The west fork has an average width of fifty feet; average depth of current in the center, three feet; velocity, two and a half miles per hour; two feet per mile. The east fork has an average width of thirty feet; average depth, two and a half feet; fall, two feet per mile; velocity, two and a half miles per hour.

Medicine creek traverses the county from north to south, at an average distance of three miles west of the east line of the county, and has an average width of forty-five feet; depth of current three feet; velocity, two and a half miles per hour. This stream is well timbered, and has three or four saw and grist mills propelled by the force of its current, and there is doubtless room for many more.

Crooked creek is four miles west of Medicine creek, and parallel to it. This stream, however, does not deserve mention, save for its timber, which in many places is of good quality and in considerable quantity; through the dry season it is destitute of water.

No creek is two miles west of Crooked and six miles west of Medicine creek. This stream traverses the county from north to south, and affords water, some seasons the year round, in sufficient quantities for mill purposes. There are no developed mill sites upon it; it is timbered through its entire length, and in some places very handsomely so. Three miles west of No creek, and parallel to it, the county is traversed by Honey creek, a still larger stream, which has a somewhat more rapid current, but in other respects is similar to No creek. Two and a half miles further west the county is again traversed by Muddy creek, which has rather more timber, but in other respects is equal to the two last mentioned streams.

Two and a half miles further west, and you come to Grand river, which has already been described, and which is heavily timbered. Its water power is much neglected; there is a dam at Trenton, however, which runs a flour mill and woolcarding factory, which does excellent work and runs all the time, except when the water is too high.

All of the above named streams run nearly parallel to each other, and have a bearing a little to the west of south, and their distance apart, as above stated, is upon an east and west line through the geographical center of the county.

We now pass to the west side of Grand river. The average distance from this stream to the west line of the county is six miles (the east fork is here considered the main stream, although it is not the larger of the two branches). The country is mostly timbered and surface broken, and near the larger streams somewhat bluffy. The creeks upon this side run from west to east and empty into Grand river and the west fork of Grand river. Beginning at the south line of the county, upon the west side of Grand river, and traversing the county to the north, the creeks come in the following order: 1. Gus creek, will afford a mill-power one-half the year; 2. Hickory creek, affords mill-power half the year; 3. Sugar creek, will support a mill-power two-thirds of the year. There are several springs upon this side of the county. The water all over the county, so far as I am able to learn, is denominated hard water. There is abundant water power in this county for manufacturing purposes. All that is necessary to corroborate the above statement, is for inquiring minds to labor for and energetically push forward to the results. Some persons would say, because they do not see the dams erected, the canals or races cut, and the water pouring down, that there are no water power privileges for manufacturing purposes in the county.

"But industry, with freedom for her sword and shield,
Will win bright laurels in this field,
Ere another decade rolls her silent round."

We have almost every variety of timber, in the following order as to quality and quantity: White oak, black oak, bur oak, Spanish oak, black hickory, elm (of all varieties), black walnut, cottonwood, ash, hackberry, honey locust, sugar maple, birch, soft maple, sycamore, linn or basswood, cherry, mulberry, and several varieties of bastard oak. There are several sugar maple orchards on the west fork of Grand river, on Sugar creek, and on the east fork of Grand river, near the northern boundary of the county.

Of undergrowth, besides the above named varieties, the principal varieties are hazel, sumach, wild plum, crabapple, grapevine and redbud.

Of wild fruit we have the crabapple, plum and strawberries of a very fine quality and, in great abundance when the season is favorable; also grapes, blackberries, dewberries, raspberries, gooseberries, wild cherries and thorn apple. There are no other vines or shrubs worth naming, except rhus toxicodendron (poison vine), which grows in unwonted abundance.

There are no government lands in the county. We have 60,000 acres of non-resident lands and several thousand acres owned by the Hannibal & St. Joseph railroad company: the latter, however, is being very rapidly taken up and improved. The average price of improved lands is twelve to fifteen dollars per acre; average price of unimproved lands, six to seven dollars per acre.

We have limestone in abundance upon the west bank of Grand river, and some upon the east bank of Medicine creek, and considerable ledges of soft, brown sandstone, suitable for building purposes.

There are some veins of coal, but none of them have been worked to profit. There is one at Trenton, which has been very slightly worked; in this the coal was of good quality; vein, twelve inches thick at base of bluff, which bluff is forty or fifty feet in hight.

There are no other ores existing in the county. There are no indications of coal oil, nor have there ever been any experiments made in boring for it.

We have six flouring mills, several woolcarding machines and saw mills, but no factories or foundries.

Besides the ordinary agricultural implements, we are using the gangplow, but with what success I am unable to say. Also the two-horse drill—the general impression is in its favor. Sulky cultivators are in use, and find favor with superficial farmers, or those who undertake to swallow more than they can get into their mouths.

I am sorry to say that there is not, to my knowledge, one subsoil or trench plow in the county; but this will not always be so.

The most common reaper and mower is McCormack's, Manny's, Ball's, and the Buckeye. The revolving horse hayrake is in general use.

There are no agricultural implement manufactories in this county, save an occasional plow-making smith. An agricultural implement manufactory would, I think, be of great account in this county.

We now have a county agricultural and mechanical society, which was chartered August 6, 1866, and is now raising funds for purchasing a fair-ground and fencing the same. There has been much difficulty attending the getting up of this society, owing to a lack of interest (I don't mean ten per cent. interest) in the minds of the people, or a lack of knowledge, or a lack of both, so that sufficient cause could not be brought before their minds to bring them spiritually into the work.

There have been one or two unsuccessful efforts in different parts of the county toward keeping farmers' clubs in operation. I deem the failures in these cases to be for the want of educational science. The most active person in getting up the present agricultural society was John W. F. Clawger, the present secretary of the society. The society has not had sufficient time, since its organization, to hold a fair.

There is not more than one-fifteenth of this county in cultivation.

We have a population of about seven thousand five hundred.

The principal productions of the county are corn, oats, hay, potatoes, sorghum, cattle, hogs, wool, apples and wheat.

The average yield of wheat, among the best of farmers, is fifteen bushel per acre; average yield in the county, six bushel per acre. Fall wheat is the principal variety cultivated. Subsoil plows and drills have been mentioned. Underdraining has never been tried. I cannot, at present, give the aggregate amount of wheat raised.

The average yield of corn per acre is thirty-five bushels. The common white and yellow are the only varieties in cultivation. Yellow corn is, by some, considered best for stock, while others think

white corn equally as good. It is either cut up and fed in the stalk or gathered and fed in the ear. Corn is not marketed in any other way here. I have no means of knowing the aggregate amount raised in the county.

The average yield of oats is twenty-five to thirty bushels per acre. The white and black varieties are raised. They are mostly fed in the sheaf, or threshed and sold for seed in the spring.

Rye is but very little cultivated. It is considered a sure crop, however, and many of the farmers are beginning to turn their attention to its culture.

Barley is not cultivated. Buckwheat is but very little cultivated.

The average crop of potatoes, under the present bad system of cultivation, is three hundred bushels per acre. Only a sufficient quantity are raised to supply home wants by most persons.

Sorghum has been cultivated by every tiller of the soil in this county; by most persons in sufficient quantities only to answer their own uses. Some, however, have manufactured considerable quantities into sirup, which has always found ready sale in the villages and surrounding country, at from fifty to seventy-five cents per gallon, for the last two years. The old Chinese sorghum, with black seed, is the principal variety cultivated, and is considered by most persons to be the best. When put in at the proper season any of our soil seems to suit it sufficiently well. Most persons use the common wooden mill, and wooden pans with sheet-iron bottom; those, however, who manufacture it more largely, use the cast-iron roller mill and "Cook's evaporator." I have seen sugar made from it, but never by "Cook's evaporator." The sugar that I have seen made from it was boiled in a pan or kettle, and after the vessel was filled and the boiling commenced no more juice was added until the whole was boiled to a sirup, then it was set or poured off and allowed to granulate. I am satisfied that in order to make sugar from the juice of the sorghum, no cold juice must be pored into the evaporator after the boiling begins.

Flax, cotton, and hemp are not cultivated in this county, save for use by those who cultivate them.

Tobacco is grown in the county for export, but in no very large quantities; the average yield is eight hundred pounds to the acre. I cannot tell the varieties cultivated. The manner of handling is nothing out of the ordinary manner which is in general use. Tobacco is considered peculiarly impoverishing to the soil, but I must confess that to me the justness of the conclusion is not so very apparent.

We have no means of knowing at present how much wool is raised in the county for export. The breeds are principally the native and the Spanish merinos. There are several large flocks. Messrs. Austin and Shanklin have several (700) hundred, of which two hundred are natives; Charles Skinner has four hundred merinos and six hundred natives, or thereabouts; Stephen Peary has a mixed flock of about seven hundred; Lee & Ryder have five hundred merinos; Wm. Dunlap has several hundred. I have not been able to hear of any disease among any flocks. We had abundant good pasturage upon the commons up to the 2d of December, this year. No one has, as yet, noticed that the fiber on fine sheep becomes coarser by careful keeping, in this county. In some localities the dogs do considerable damage among sheep. In one flock that I know of, this fall the dogs destroyed five out of every hundred.

Considerable attention is now being paid to the cultivation of tame grass for pasturage. Blue grass is the kind in use. Timothy, millet, and Hungarian are the kinds used for hay. The average yield of timothy is one ton per acre; millet and Hungarian yield, according to the method of cultivation, from two to five tons per acre. Blue grass seems to be worthy of every attention for pasturage.

Hedging has been tried—Osage and white willow—the latter is considered worthless as to its use for a fence; as an ornament it may be of great value; the former is an undoubted success, and is so considered by all who have tried it. It is some ten years or more since the first was planted in this county. It is the thing for a fence wherever it will grow. Our winters injure it sometimes, while it is yet small.

There are considerable numbers of fat hogs driven to market from our county, but I could not guess as to the precise figure. Some two years ago Mr. A. B. Young introduced the Chester white stock of hogs; since that time, George H. Hubbel, William Harvey, Charles Skinner and C. Evins, have introduced some of the same breed from Chester county, Pennsylvania. They seem to be finding great favor with our people. In my opinion, a cross between them and the improved Suffolk will make for our wants a better breed than either of the above named breeds.

There are about two thousand head of cattle driven to market annually from this county. There are about five thousand five hundred head, of all ages, in the county, at present; there have been but few efforts made up to the present time to improve the breed, and those have all been in the direction of the "short horns." One of my neighbors, Mr. Cain Urton, has brought a fine yearling of this breed from Illinois. There are no dairies in the county, nor any one breeding for the dairy.

I cannot tell how many horses are raised annually; the average price is $125; there is nothing worthy of mention beyond the common scrub stock, and no effort is being made to improve upon it.

The same remarks will apply to mules and asses as has been said of horses.

A general and more than ordinary interest is being taken by all of our farmers in the fruit business; such as the planting of orchard fruit, vineyard and shrub fruit; there are, however, but few of the above old enough to be in bearing; those that are, however, turn a handsome profit. Mr. Wm. Metcalf, three miles west of Trenton, is the only professional fruit grower and nurseryman in the county. He has an orchard ten or fifteen years old, one thousand trees of which are in bearing, and two hundred not yet in fruiting condition; the above named trees (all apple) and a small nursery, brought him an aggregate income of one thousand dollars the last season. He told me that he sold from one of his own seedlings (apple) the past summer $19 75 worth of fruit, besides using some from the same tree of which no account was kept. From a single tree, it seem to me this is worth mentioning.

Altogether there are hundreds of grape vines planted in the county, yet there has not been enough planted by any one person, until the present year, to be called a vineyard. Vines seem to flourish finely here upon our high lands; even the fickle Catawba, Isabella and Delaware seem to do much better than some of our writers upon grape culture would lead us to imagine. Wm. Metcalf has two hundred vines; they are all young; his three year old Catawba fruited the past season. He has the following varieties, viz., Concord, Catawba, Clinton, Iowa, Israella, Isabella, Hartford prolific, and three varieties of unknown names. Mr. Metcalf intends planting one-third of an acre the ensuing spring. Mr. Barnes, near by him, will plant one acre in the spring. Mr. Metcalf also speaks very highly of the Lawton blackberry and strawberry.

The health of this county is unsurpassed by any locality in the valley of the Mississippi, or between the Alleghany or Rocky mountains. I say this not boastingly, nor to draw emigation; but to corroborate the statement would refer parties to every practicing physician in the county.

And in conclusion, let me here say that I have traveled over the best parts of Tennessee, Illinois, Iowa, Missouri, Kansas, Arkansas, and the Indian Territory, and that in my humble opinion, this part of Missouri is equal to any of the above named countries for miscellaneous agriculture and independent farm life. Here nature seems to have done her best in the arrangement of soils, high land, low lands, timber, water, drainage, and in short all but the manual labor and head-work.

This county being traversed north and south by valuable streams of water, whose average distance apart, the county over, is but three and a half miles, is a thing not to be lost sight of in the eye of the manufacturer.

The points for which this county seems most marked, in looking for promises of her future greatness, are the sheep-fold, the dairy and manufactories.

JOHN N. F CLAWGER,
Secretary Grundy County Agricultural Society.

GRASSY CREEK, Mo., January 5, 1867.

Dr. L. D. Morse:

SIR: Your circular of December, 1866, was received two days ago.

Frost left the ground in the middle of March; was fit for the plow on the first day of April. A cold wind blew from the first to the middle of April, then cold rains set in, and continued for two weeks, keeping the ground too wet for the plow and too cold for the germination of seeds. By the first of May the soil became fit for the plow, and warm enough for the growth of plants. Corn planted previous to or during this (above named) wet and cold spell, rotted in the ground, and had to be planted again. Corn planted between the first and the twentieth of May came on well. Oats sowed by the first of May did well. From the first of May to the first or tenth of June we had frequent showers and warm, sunshiny weather. From the last of June until fall, the season was very dry and hot; the rain which fell was very meagre in quantity, and of an entirely local character, given off by small, high, vapory thunderclouds, passing swiftly, with much electricity and sharp reports of thunder. After the sixth of September rains began to fall of a more general character, and by the first of September the ground was again thoroughly moist. The first frost that made any impression fell about the fourteenth of October. We had a beautiful autumn; no cold weather until in December.

There has been nothing to find fault with in the fruit anywhere in the county, so far as I am able to find out. There are but few orchards of any notice in the county. I have not heard any

one, who has orchard trees old enough to bear, complain of having no fruit this season. There were no peaches anywhere in the county; but of apples, pears and grapes there was a good crop. Grapes are not much cultivated in this county; many young vines were planted last spring, and seem to do well. I have not heard of their suffering in this region from the blight or rot. The cultivation of fruit is largely on the increase.

This year we have but a half crop of corn; wheat, about a half crop; oats, a full crop; barley, none cultivated; hay, a full crop.

In our soil, which is a sandy loam, for a full crop of corn we depend much upon "the early and later rains." Of the former we always have a sufficiency, but of the latter we often feel greatly in need; and that was our condition the past season. Early oats and hay, ripening before the drought of July, were not injured. In the course of two or three years more information in great abundance can be had on these points—especially upon the grape.

I am, etc.,

JOHN W. F. CLAWGER, M. D.

HOLT COUNTY.

BY GEORGE MEYER.

Dr. L. D. Morse:

SIR: Holt county is situated in the northwest portion of the state, on a line with Kansas, separated from Iowa by the county of Atchison, and is bounded on the east by the counties of Audrain and Nodaway. In shape it is somewhat irregular.

The surface is diversified and undulating, excepting the bottoms along the rivers, which are level. The timbered surface is somewhat more rolling than the prairie; but a very small potion is so uneven as to render it unfit for farming purposes.

The soil is generally of a dark color, fertile, and very productive for grains, fruits and vegetables of nearly every description adapted to the climate of this latitude; it is also of great depth and very durable, as I know of land that has been cultivated nearly every year for upward of twenty-eight years, without the use of manure, and it is yet very productive.

The Missouri river forms the west and south line. The Nodaway, which forms the east line, is about seventy-five yards wide, and about twenty-five feet deep, when full; its bottom is generally solid, and current swift. It is doubtless one of the most efficient streams for manufacturing purposes in this upper country; it is navigable for ten or fifteen miles for small boats, and there is one now plying upon it, transporting wood for the use of steamboats on the Missouri. The Big and Little Sarkio are the only rivers running through any portion of the country. The Big Sarkio flows through the northwest part of the county, is twenty or twenty-five yards wide, and the average depth eight or ten feet; the current is sluggish. The Little Sarkio flows from north to south through nearly the whole length of the county; its width, depth and current is very irregular; it is not considered very efficient for water power. There are numerous creeks (which are generally from springs), several of which afford sufficient water, the most of the year, for mill purposes. Springs are numerous, and are generally very durable. Nearly every farmer has an ample supply of living water, for all purposes, upon his own land. The water in the timber is limestone, and therefore hard, while that on the prairie is principally soft. There would be available water power for manufacturing purposes if applied.

The timbered land comprises about one-third of the county, and is chiefly confined to the bluffs in the vicinity of the rivers and creeks. Red, white, black and bur oak, black walnut, cottonwood, linn, hickory, and elm, are predominant, and afford sufficient lumber for nearly all purposes, also plenty of fuel, of which there is a great amount cut annually for the use of steamboats on the Missouri; there are also some maple, honey locust and ash. Wild fruit abounds in abundance, grapes, plums, mulberries, hackberries, cherries, pawpaws, black and raspberries are the principal varieties. Hazel and sumach are the principal shrubs.

Government lands have all been sold. There is considerable prairie land owned by non-residents and speculators, the timber being owned by improved land holders. The average price of improved farms is about fifteen or twenty dollars per acre, with an upward tendency; the average price of unimproved land is about five dollars per acre.

Limestone abounds to a considerable extent. There is sand and slatestone, and a few flint.

There is unmistakable indications of coal, but owing to the great amount of growing fuel there has been little prospecting done, and no mining. No other minerals have been discovered.

There are five flouring mills in the county; three being run by water alone, one by steam, and the other has the benefit of both steam and water power. There is a large steam mill fast being erected in Forest City, and is expected to be in running order the coming spring. There is one large steam woolen factory, situated about one half mile southeast of Oregon, the county seat, owned by Daniel Kunkle. It is a very substantial brick building, three and one half stories high, thirty-three feet wide by seventy in length, and has an additional building containing the engine. The machinery is quite extensive and efficient. There are three steam and two water power sawmills, all of which do an extensive business.

The agricultural implements in use are generally of the best quality. Mowers and reapers are used almost universally. The McCormack, Kentucky harvester and Buckeye, are the principal kinds. As a combined machine the McCormack is considered the best and most durable. The steel plow is in universal use; no other can be used with any advantage. They are mostly of Illinois manufacture; the Moline and Peoria are considered the best. The gang plow is used to some extent, and with good success on smooth prairie. The best and latest improved corn planters are generally used, but Brown's patent is the principal one, and is considered the best. Various patents of the buggy corn plows have been introduced, and generally give good satisfaction. Pitt's Ohio manufacture of threshing machines are most extensively used, and are considered the best.

There was an agricultural society in existence before the late rebellion. It was organized in 1858. Although of short duration, the results were good, and give credit to the officers, who did their utmost to make it interesting and beneficial. There are none of the leading officers now abiding in the county. There were three fairs held, which were largely attended, and proved entirely successful. The premiums consisted of silverware of the best quality. The exhibition of stock, farming utensils, agricultural and horticultural products, fruits, etc., was extensive, and of the best quality.

Not more than one-fifth of the county is in cultivation.

The population, according to the last census (which was taken two year ago), was something over six thousand; it has increased since that time to about eight thousand.

The chief products are corn, oats, wheat, rye, barley, potatoes, and fruits of quite a variety.

Wheat is produced to a considerable extent, and is generally of the best quality. The average yield produced by the best farmers is about twenty bushels per acre. The average yield in the county is about fifteen bushels per acre. Spring and fall are raised in about equal proportions. The subsoil plow and underground draining have not been tried, nor are they considered necessary. The drill has been tried to some extent, but without flattering success. The aggregate amount of wheat produced annually is about sixty thousand bushels.

Corn is the principal production and is cultivated very extensively. The average yield per acre is about forty bushels. White and yellow are the principal varieties. White is considered best for hogs, and yellow for cattle and other stock. The greatest portion of the corn is fed to hogs and and cattle, and the surplus is mostly shipped from Forest City, by the Missouri river, to Fort Leavenworth and St. Louis. The annual production is about eight hundred thousand bushels—that being as near the exact amount as it is in my power to give.

Rye is produced quite extensively, and is considered the surest crop of small grain we have. Two and even three crops are sometimes produced from one seeding. The average yield per acre is about twenty bushels. There is but a small amount harvested, it being mostly fed on the field; it is, therefore, impossible to arrive at the approximate estimate of the amount produced annually.

The average yield of oats per acre is about forty bushels. White, white Poland and black are the different varieties. The white is raised most extensively and generally considered the surest. The annual production is near twenty-five thousand bushels.

Barley is raised to some extent, and its production is on the increase. The average yield per acre is about thirty bushels; it finds a ready sale at the brewery at Forest City, at which place it is principally marketed. The amount produced this year is about forty thousand bushels.

Buckwheat used to be raised to some extent, but its cultivation has almost entirely ceased. The average yield per acre was about twenty bushels.

The average yield of Irish potatoes is about one hundred bushels per acre. The kidney and early York are the principal early varieties; the early York are considered the best. Of late potatoes, the while and black neshannock, peachblow and pinkeye are the principal kinds; the peachblow is the surest. But few potatoes are raised for market. It is impossible to give the aggregate annual production.

Sweet potatoes are raised to some extent and yield abundantly, but it is difficult to preserve the seed over winter.

Sorghum is generally cultivated for home consumption, which it about supplies in sirup. Its yield is from seventy-five to one hundred gallons of excellent sirup per acre. There have been several varieties introduced, but the genuine original Chinese sugar cane is considered the best. No sugar has been manufactured from it. Several of Cook's evaporators have been introduced, but the metal crusher and sheet iron pans are chiefly depended upon for its manufacture.

Hemp was raised extensively before the war and with good success; the average yield per acre being about eight hundred pounds. Slave labor was chiefly depended upon for its cultivation.

Flax has no extensive production; a few persons raise it for domestic consumption.

There has been some small patches of cotton cultivated with varied success. It is generally conceded that the summer season is too short for a successful and extensive cultivation of the fiber.

But little tobacco is raised for market; it is mostly produced in small quantities for home consumption. The yield is good and the tobacco of good quality. It is the general opinion that the soil is well adapted for its successful and extensive cultivation.

There is considerable wool of a coarse quality produced for export; it is impossible to give the exact amount, as there is no one in the county particularly engaged in buying wool for that purpose. There is a great amount manufactured at the factory of Mr. Kunkle for home consumption. The breeds of sheep are of the common grades, except a few that have lately been shipped from the east. There are no large flocks. Wild grasses are chiefly relied upon for pasturage. No other county is better adapted to the good health of sheep and the growth of fine wool. There is some injury incurred by both wolves and dogs.

There is considerable hay put up annually, but it is mostly of wild grass. Tame grasses have been introduced to some extent with various success. Blue grass is easily produced and is considered excellent for pasture. Timothy is raised to some degree and yields well. I put up, the last season, eighteen tons of excellent timothy hay produced on five acres. The average yield per acre is about two tons.

The Osage orange has been tried quite extensively, and in most cases with good success; their first introduction was in 1851, and there are now numerous fences that are insurmountable barriers for all animals. The willow was introduced a year ago; nothing is yet known as to their success. It is the general opinion that the orange is the most efficient, as nothing has yet been found to hinder its successful growth for fencing purposes, if attended to in the right manner.

There were about nine thousand hogs produced last year; it will, perhaps, fall short of that number ten per cent. this season. The present prospects are that the production will reach twenty thousand the coming year. They are principally marketed on foot.

The number of cattle now in the county, according to the assessment lists taken this fall, is eight thousand three hundred and thirty-three. There are a great many fatted for market; but it is impossible to give the exact number. There are none slaughtered except for home consumption. No person has undertaken to raise cows for dairy purposes, although the facilities are good.

The number of horses, according to the assessment lists taken this fall, is one thousand four hundred and twenty-nine. The rebellion monopolized the raising of horses to some degree; if anything they decreased in number—great numbers being stolen.

Mules are raised to some extent, but particularly for market. There are six hundred and ninety-six according to the assessment lists taken this fall.

The people are most generally raising orchards, and with good success. I here submit a report of the different varieties, with their sub-varieties:

Both soil and climate are well adapted to the healthy and thrifty growth of apple trees. Trees grown in our western nurseries, being acclimated, are necessarily better adapted to our wants than those grown in eastern nurseries. I would not discourage the introduction of new varieties of apples from the east or from any part of the world. There are numerous good orchards in the county, some of which bear a thousand bushels of fruit annually. Trees generally bear at an early age and quite abundantly. I gathered seventeen bushels from one tree of only ten years' growth from the time of being set out. Apples are of superior quality, being entirely free from insects or worms. The varieties best adapted, that have been introduced, are: Summer apples—Caroline red June, early harvest, red astracan, golden sweeting and early Joe; fall apples—pound pippin, fall pippin, Holland pippin, smockhouse, rambo and cat head; winter apples—Union red genitan, white winter pearmain, Rhode Island greening and yellow bellflower. The Union red is a good bearer of beautiful and well flavored fruit, and I can recommend the tree to fruit growers as being best adapted to this climate. Great quantities of apples are hauled to Kansas, Nebraska and Iowa, in which states they always find a ready and good market.

Some years ago, there was considerable of delicious peaches raised; but, of late years, the winters have been too cold and the trees have most all been killed.

This county is well adapted to the raising of pears; they are free from insects and almost without blight. For standard trees the following are the best: Flemish beauty, Bartlett, white Doyenne, winter Nelis, Buffam, Laurance, Neurean Poiteau, Shelton, Seckel, Beurre d'Aunburg and Madenline; dwarf—Louisa Bonne of Jersey, Duchess d'Angouleme, white Doyenne, Beurre Diel, Beurre d'Alencon, Rosteizer, Doyenne d'Ete, Napoleon, Vicar of Winkfield, belle lucrative and Urbanister.

The soil and climate are well adapted to the growth of the grape and the production of its delicious fruit. The following are the best varieties that have been introduced: Concord, Delaware, Isabella, Catawba and Virginia seedling. There are about eight acres in cultivation.

Perhaps it would not be improper to give a short sketch on general improvements, schools, churches, etc.

Oregon, the county seat, contains a population of about one thousand. It is beautifully situated, two and one-half miles from the Missouri river. It has quite a number of good stores, which do a thriving business. There is also one weekly paper published, called the Holt County Sentinel. There are several churches in the town.

Forest City, situated on the Missouri, has a population of about four hundred and fifty. It is the principal grain market.

There is no railroad running through any portion of the county at present, but we are in anticipation of the early completion of the road that is to connect St. Joseph and Omaha. When finished it will be a source of vast benefit to the commercial interest of the county, as it will run through its whole length.

Schools are numerous, and are well supplied with public funds.

The Presbyterian, English and German Methodist, Protestant Methodist, Missionary, Baptists and United Brethren are the principal denominations.

It has been my endeavor to give a correct and interesting report of everything, but I found it no little task. Owing to the press of other business I was unable to give as full an account as I should liked to have done.

HARRISON COUNTY.

Dr. L. D. Morse, Esq.:

DEAR SIR: Your circular requesting information in regard to questions therein propounded is received, and were it in my power to give full and satisfactory answers to them I should certainly answer them with pleasure, but I am deprived of that time and opportunity required to give that extended reply and that exactness of statistics the subject deserves. As it is, however, feeling a great interest in the agricultural and horticultural developments of the country at large, and especially of our county, I feel it my duty to give as nearly as possible a correct reply to your queries as the time at my disposal will admit. I would remark, then, in reply to your first question—"the general character of the season in the spring, summer and autumn of 1866; in regard to heat and cold, moisture or dryness, rains or thunderstorms"—the spring opened with its usual favorableness for agricultural purposes, and remained so, with occasional showers, till the last days of May; at which time the rains became pretty continuous, with short intervals, till about the 8th or 10th of July, with moderate heat for that season of the year, and a less amount of thunder and lightning than usually accompanies such incessant and violent rains. From the earlier days of July to the latter part of August the rains became less frequent and of less quantity, but still, comparing with other years, during the same time of the year, I should think we had about twice as much rain. So far as severe thunderstorms and wind is concerned, we have, during the same time, been peculiarly exempt last season, in comparison with former years. I know not if any meterological table was kept here during last year; nor do I know the thermometrical variations, nor the thermal average during the season just past, but I would remark, that during a good portion of the latter part of spring and the summer months the weather was very warm. I do not think, however, that there was a greater proportion of hot weather during the season than what usually occurs in this latitude. During the fall months we had a good deal of wet, especially during the latter part of September, which terminated in a severe frost about the first days of October, after which the weather settled and became fine and salubrious, and continued so during the entire fall months, with only an occasional shower and frost.

The second query: "What was the character of the fruit crop; was there a full crop of apples, grapes, peaches or pears; are grapes much cultivated in your region; did they suffer much from the blight or not; is the cultivation of fruit increasing?" In reply to the foregoing questions, I would say that the leading peculiarities of fruit raising in our region is that preference is given to the apple culture over the other fruits. Experience, as heretofore had by our farmers, does not prepossess them in favor of the culture of the peach, although there are a few orchards of which I am acquainted here, grown in the form of thick groves, which rarely fail to produce more or less, as the season is more or less favorable. The peach, however, grown singly here is very apt to be winter or spring killed, and thus fail. Last season there were no peaches, or at least none of any consequence. The bud was said to be winter killed during the sleet last winter. We had a moderate crop of apples, with the exception of some kinds; however, not an average crop compared with other years. The genitan, winesap, romanites, belleflowers, golden and Vandiver pippins did remarkably well, together with some kinds of summer and fall apples, the names of which I could not recognise. There was one peculiarity, however, of the apple crop last season, attributable, doubtless, to too much rain, together with our early frost, commencing about the middle of October and continuing till picked. Large numbers of them disengaged their attachment to the stem and fell. Considerable complaint was made by fruit growers of that peculiarity of last season. In regard to pears, there are not enough in bearing condition to justify anything being said about them, except that they grow well, and that there is a growing interest manifested on the part of our people to cultivate them, and that facilities for their procurement now offering has induced a good many to obtain them for trial. Grapes seem to do well, so far as tried. A few enterprising men have obtained and are now cultivating them on their farms. So far as I have conversed with those persons, they say they do well and are as sure a crop as other fruits, and are usually free from blight. Last season, so far as my inquiries go, they did well—those in bearing condition.

I am happy to state, that with our increasing facilities for purchasing the roots, together with peace and quiet, develops a commendable and increasing attention among the people to their culture.

In reply to the third question, viz: "What is the relative condition of the crops this year in regard to corn, wheat, oats, rye, barley or hay; how do they compare with last year, or with a general average?" The last season was remarkably well adapted to fall wheat, or at least the fall wheat did remarkably well, producing large fine heads, and plump grains. Oats did well; also, rye and hay. I do not know of any barley being raised in our county. I should say the average product of wheat, oats, rye and grass crop of last summer would run fifty per cent. above former years.

So far as corn is concerned (it being a crop requiring special culture to develop it to the maximum of productiveness and quality), owing to the unfavorableness from wet and early frost of last season, it was comparatively a failure, both in regard to quantity and quality.

It is generally thought among us that there is not over half of an average crop. Taking the quality into consideration I think it very doubtful if it exceeds, or even comes up to an average half crop.

Having answered your queries to the best of my ability, with the data at command and that time will allow, I would further remark that, so far as our county is concerned during and since the close of the war there has been but a moderate emigration to our county. During the year 1865, we had a considerable emigration here, and I am happy to state that the character of the new comers, was such as is required to develop the resources of a new country. Our lands are of the peculiar characteristics of northwest Missouri—prairie and timber. The character of the soil is vegetable soil, all of which is peculiar to northern Missouri and southern Iowa. Lands are worth from ten to twenty dollars per acre, according to improvements, location, etc., and hundreds of acres of virgin soil awaits the influx of industrious emigrants—at from three to five dollars per acre—to develop their beauty and productiveness.

Deprived as Harrison county has heretofore been of railroad facilities—robbed of that influx of emigration she justly deserves, considering her healty climate, cheap lands, with a fair proportion of good timber fine quality of soil, and due proportion of water privileges, I am happy to state, however, for the information of those seeking homes in Missouri, that this disadvantage will soon be overcome, as the efforts which are now being made by the enterprising officers of the Kansas City and Desmoine railroad company, will soon cause to be built (to us) important thoroughfares.

In regard to agricultural and statistical reports, I wrote to you the last of November that it was out of my power to make any this season. Owing to professional and other engagements and want of data, I could not make you a readable report. I make the foregoing from a sense of duty,

and to show a disposition to accommodate, and not because I think it comes up to the measure of a report on the subjects treated of.

Very truly yours,

J. M. ROBERTS.

HICKORY COUNTY.

ELKTON, October 28, 1866.

Dr. L. D. Morse: Hickory county is bounded north by Benton county, east by Camden and Dallas counties, south by Polk county, and west by St. Clair; it contains about 294,000 acres, about one-third prairie, the other two-thirds consists in part of good timber, brush and scattering trees and shrubs. The surface is generally rolling; some level prairie, and rocky hills and ridges. The soil is of almost every kind to be found in any country, from the richest alluvial bottoms to the rock, flint ridges. There is a difference of elevation of at least four hundred feet between the highest and lowest land in the county. The only stream of any size is the Pomme de Terre, running through the center of the county from south to north. It affords water enough for mills the most of the year, and, in a common stage has a depth of two to three feet on the shoals; width ninety feet, and a middling current (perhaps), three miles an hour; when full it has a depth of twenty feet, and runs rapid. There are many creeks and branches; the principal ones are Little Niangua, Lindly and Crane creek, in the east, and Wablow and Hagle's creek, in the western part of the county. Springs of good lasting soft water are numerous.

Oak is most abundant; black oak, post oak, pin oak, white oak, bur oak, willow oak and black-jack, white and black hickory, black and white walnut, sugar tree and maple, sycamore, hackberry, honey locust, besides many kinds of shrubs and vines. Hazle, persimmon and sumach are very abundant, and many other kinds less numerous, such as sassafras, pawpaw, redbud, black and red haw, willow, and some others I have no name for. The wild grape is the vine most abundant, though there are other kinds of creepers to be found.

Wild fruits and berries are numerous. The principal are grapes, haws, plums, persimmons, hazle nuts, walnuts and hickorynuts; of berries, we have strawberries, raspberries, dewberries, gooseberries, alderberries and blackberries.

There is a good deal of land owned by the government. I have no means of knowing the amount, but I suppose there are several thousand acres, mostly of inferior quality. About fifty thousand acres are owned by non-residents, none by corporations. Improved land can be bought from five to ten dollars per acre—unimproved from two to five dollars per acre.

Rock is abundant. We have limestone enough to supply the world for sometime to come; besides some stone, cottonrock, flint and other kinds.

There has been but one coal vein opened in the county that I now of. The coal is of a poor quality, but has not been worked to any extent. There is good surface indications of coal in many places. Iron and lead are both found in chunks on the surface; no mines of either have yet been opened; lead is known to exist in leads, and will no doubt be worked before long. There are no indications of coal oil, that I am aware of.

There are three steam and one watermill in the limits of the county. They all grind corn, and some of them make, from good wheat, what is called flour in this country. We are sadly in need of mills. There are many good sites to locate both steam and water mills.

No foundries or factories. We have carding machines that card the wool, and is then spun and woven into cloth on the hand wheel and loom.

All kinds of plows are used that are made throughout the west. All things considered, the Jewet is perhaps the best plow for this county. Reapers, mowers and threshers of different kinds are used with good results. No implement manufactories in the county. There has never been any society organized for the promotion of agriculture. No fairs.

About one-twelfth of the land in the county is in cultivation. The census of 1860 gives the total number of inhabitants at 4,705, of which number one hundred and ninety-five were slaves, and seven free persons of color. It will not vary much from the above figures at present, except in persons of color, but few of which are now in the county. No slaves

The principal farm products are corn, wheat, oats and hay. Wheat, when properly put in, on

good wheat land, will yield twenty bushels to the acre. The best wheat land is the red land; it will not freeze out, and is sure to yield well. Fall wheat is mostly cultivated. Spring wheat is raised to some extent. It does well on the black ground, where winter wheat will freeze out.

Subsoiling, underdraining and drilling have not been tried here to my knowledge.

Corn is the great staple production of the county. On the good corn land, with proper cultivation, the average yield is forty bushels to the acre, while seventy and eighty have frequently been produced. Several varieties are produced. The large white is common, while some farmers prefer the yellow; others a striped kind, mixed with blue and red. Most farmers think the yellow the strongest and best for stock, but all prefer the white for bread. The crop is fed in the ear, some husked, and some cut up and shocked in the field till winter, then hauled out and fed to cattle, stalk and all; it all finds a market in the stalk; considerable is ground and eaten for bread.

I have no statistics to give the amount of anything raised in the county. The statistics are now being taken, but will not be completed before the first of January—too late for this report.

Oats are raised as a farm crop; average yield, twenty bushels to the acre, and are generally fed in the sheaf.

Rye, barley and buckwheat are but little raised. Where properly put in they yield well.

Potatoes are only raised as a garden product. They may be considered a rather uncertain crop. They frequently run more to tops than roots. Sweet potatoes do the best.

Sorghum of several varieties are cultivated; mostly on a small scale. It grows fine and does best on the red land. No sugar has been made from it that I am aware of, though when boiled thick there is a large portion of it becomes grainy. Both iron and wooden mills are used to press out the juice, and it is boiled in all sorts of pots, kettles and sheet iron pans.

Hemp and flax are but little produced. Both are raised for the fiber alone. Cotton has been produced in considerable quantities for home use, on red clay or clay and gravel mixed. A good crop will make two hundred pounds of clean cotton to the acre.

Tobacco is produced by some farmers, but not in quantities sufficient to supply the home demand. Tobacco raisers say it does not injure the land; on the contrary, they think it improves the land. Other crops grow after it very fine.

Sheep are kept in flocks from ten to one hundred. If there are any larger flocks I do not know of them. They are mostly of the common kinds, or natives. The wool is mostly used in the county, being made into jeans, linsey, socks and bed covers. Sheep are remarkably healthy. The wild pasturage seems well suited to their wants. Quite a large number are killed every year by wolves and dogs. Strychnine is the best thing to keep dogs and wolves from killing sheep.

Tame grasses are cultivated for hay. Timothy will yield about one and a half tons to the acre. Hungarian is not much raised. It yields well.

Hedging was commenced several years ago, but has been left to grow up into forest trees. It grows thrifty, and is not killed by winter or anything else. The opinions of those who have tried it are that it will make a good and durable hedge.

Hogs are not raised in sufficient numbers to supply the home demand. They are a mixture of most all breeds. When killed at one and a half and two years old they will average about two hundred pounds.

Cattle are raised in large numbers, but generally of the scrub breed. Some of the better breeds have lately been introduced. They are mostly sold to drovers and taken to the St. Louis market. There are no dairies in the county.

Considerable attention is paid to the raising of horses. Many very good ones are raised. The average price is about one hundred dollars.

Mules are raised in large numbers. The average price, when grown, is one hundred and twenty dollars; extra ones bring one hundred and fifty dollars. Before the rebellion they were driven to the cotton states, and during the war they found a market in the armies.

A great part of the farmers are raising small orchards for their own use. Both peaches and apples do well, and are a very sure crop on the high land, but often fail on the low ground. I know of no vineyards in the county. They would certainly do well if planted. Wild grapes grow in abundance, and of good quality.

In conclusion, I would say that our county is well suited to stock raising and mixed farming, being well watered and timbered, and abundance of wild grass, thousands of tons of which dry up and serve no better purpose than to burn up farms every year. It could be profitably converted into wool, mutton, beef, butter and cheese. Much of the land is excellent for corn, wheat and vegetables, while some is more suited to grass. All things considered, sheep would pay better than any other stock. They need but little feed the year round. Thousands of acres of land will remain a public pasture for a long time. Much of it is very rocky and hilly, but produces good wild grass.

What we need most is enterprising men to develop the resources of our county.

Many find fault with our county because it is so far from market; I always manage to sell all I can raise at living prices.

Immigration into our county since the war has been large and of the right kind. We say come on; there is room for many more yet. We need blacksmiths and farmers, and men to build mills and factories.

The change in the labor system has not been felt much in this county; but few of the former slaves remain; there is not much demand for labor at present; common laborers receive from fifteen to twenty dollars per month; one dollar per day, board included.

R. B. RUNYON.

ELKTON, MISSOURI, January 1, 1867.

Dr. L. D. Morse:

DEAR SIR: Your circular of December is at hand. I proceed to give the information you ask for to the best of my memory. The early part of spring was warm and dry—fine for sowing spring grain; in April it set in wet and continued wet till the last of May; it then turned off very dry, till about the first of September, when it commenced to rain in showers till about the middle of the month; we then had a perfect deluge. It came down in torrents, sweeping away fences and doing much damage to corn crops; it continued into October; since then the rains have been moderate. There were no heavy gales of wind during the season; thunder and lightning very mild—more so than usual. The whole season was moderately cool, except a few days in July, which were extremely hot.

The crop of apples was a fair average; pears the same; peaches not very good; grapes not cultivated. The crop of wild grapes was good. The cultivation of fruit is on the increase. This is a good country for fruit of all kinds.

The wheat crop was good—more than an average; corn light, not more than a half crop; oats, hay and vegetables a fair average crop.

The foregoing is about all that I can think of at present that would be useful or interesting to you. They are, of necessity, brief, as this part of the country is in the background in regard to fruit growing and agriculture generally.

The weather is clear and cold; thermometer at zero at sunrise.

Yours, very respectfully,

ROBERT B. RUNYON.

IRON COUNTY.

IRONTON, MISSOURI, December 25, 1866.

Dr. L. D. Morse:

SIR: In answer to your circular I would say that the spring was early, with frequent warm showers. Planting was done a month earlier than common. The summer was not oppressive, but steady warm weather. The thermometer ranged from 85° to 96°; only a few days as high as 96°. Showers were very frequent until about the middle of July; then a dry spell until about the 1st of September; frequent rains ever since; more than common. The fall has been very warm and wet, more than is common. I would here state that every full moon has brought with it a cold spell, and all but the months of July and August we had slight frosts. We have had but little thunder and lightning—not as much as common.

Apples blossomed well, but the cold winds of the full moons caused them to fall off a great deal the last year and this (that is, the years of 1856 and 1866). The apple crop has suffered by worms in the eyes of the fruit, which caused them to rot and fall off, a thing that was never known in this part of the world before. Peaches were a full crop; every tree bore to its full capacity, and of superior quality. Pears were good. I cannot say so much about grapes, as I am not much of a wine grower—have a few for my family; but there are several fine vineyards in our county. I saw some fine grapes, but how the general crop was I cannot say.

The cultivation of fruit is largely on the increase in the vicinity of Ironton. I think there has

been planted out, since 1861, more than ten thousand fruit trees, and that too, when our valley was filled full of soldiers, and amid the sound of war. I have on my farm now one thousand trees of different kinds of fruit; of apples about nine hundred, and most of them just coming into bearing. We plant nothing but choice fruit, and if we can find some means to get rid of the pest, we can and will raise as fine fruit as any portion of the world.

The corn crop in most cases was a failure, or partially so. The drought was severe in the time of earing with most fields; but my own crop, which was an old meadow sod, broken up with two yoke of oxen and a large sod plow, twelve inches deep, never suffered in the least; it was cultivated with a cultivator. Winter wheat is the only kind raised here—the crop fine, the grain large and white. I will just say that we have only one drawback in raising good wheat, and that is the pest. If we get our wheat in early, say the 10th of September, we hardly ever fail. Oats are not raised much here. Barley is seldom raised; the straw grows so short you would want a basket to put it in.

Hay could not be beat. This county is well adapted to all the grains; all kinds grow to perfection, and hay is one of our best crops. Nothing pays as well here as hay—we always get a good price. My meadow will yield from one and a half to two tons of timothy per acre, and I have never got less than ten dollars and fifty cents per ton in the field as soon as made; and in the shock and during the war, much higher.

In conclusion, I will say, I have never seen a better county for fruits of all kinds—from the strawberry to the largest beet. All grow to perfection.

All kinds of vegetables do well except Irish potatoes, and they do well if planted in the month of March or middle of June, as we are subject to a dry spell in June or July. Sweet potatoes grow fine. Last year there were more Irish and sweet potatoes, and larger ones than I ever saw, and yet they were worth one dollar per bushel.

I raised apples this year (1866) that measured thirteen inches in circumference. Peaches were raised in this valley eleven and twelve inches around; and this is not bragging, for samples were sent to the Enterprise office at Ironton. Strawberries of mammoth size were raised; and our valley is famous for its roses, dahlies, etc.

You will excuse me for calling your attention to these things. I would be glad to have you give us a call.

Yours, etc.,

THEODORE O. RUSSELL.

JEFFERSON COUNTY.

L. D. Morse, Corresponding Secretary:

SIR: I received your note containing circular and inquiries concerning our county, relating to the resources, productions, etc., and knowing the importance of having it properly performed, would have been glad if it had been referred to some one more competent to the task.

This is one of the center counties on the eastern border of the state, and is nearly surrounded by water courses: the Mississippi on the east, the Meramec on the north, Big river on the west and through the center, and Isle au Bois on the south. The Mississippi, being the greatest commercial river in the world, its importance is well known. The Meramec is navigable in high stages, for small boats and flats, some eighty miles to James' iron works, from which place the iron was all brought down by boats before the building of the southwest Pacific railroad.

In early times there was a considerable quantity of cedar and pine logs rafted down Big river, but this business has entirely ceased, in consequence of the frequency of dams for mills, of which there are many sites and several mills.

Big river runs nearly north and empties into the Meramec, and is very crooked; has a rapid current, especially in high stages, of which it has many, and from which it takes its name. If properly improved, it would have an almost unlimited water power.

The Isle au Bois (pronounced zill aw boy) is a small stream on the south flowing into the Mississippi, and the Platin, Joachim, Sandy rock and Auglaze, all flow eastwardly and into the same, and have many fine mill sites on them, with only a few improved. The water in all is clear, being generally formed by springs, and all have plenty of the smaller kinds of fish in them.

The county being at the northeastern terminus of the Ozark range of mountains, it is generally

high and broken, rolling and undulating, the northern part sloping to the northeast, and southern to the southeast.

The soil is what might be called limestone, with clay subsoil, except narrow bottoms of alluvial formation along water courses.

There are some of the largest and finest springs in this county that there are in the State, with an unlimited number of small ones scattered all over the country.

The county is entirely covered with timber, except where improved. The varieties are as follows: red, white, black, post and pin or turkey oaks, black and white walnut, chinquepin oak, black, white and shellbark hickory, white and sugar maple, red and slippery elm, blue ash, swamp ash, sycamore, cottonwood, hackberry, buckeye, linn or basswood, wild cherry, honey locust, mulberry, red cedar, coffee nut, pecan, willow, etc.; the oaks and hickory predominating.

Our shrubs are hazel, red and black haws, sumach, persimmons, sassafras, pawpaw, serviceberry, dogwood (both hill and swamp), spice wood, several kinds of plums, crabapple, red bud and white thorn suitable for hedging, and several of which I do not know the names, grow along all water courses. Vines and creepers grow in profusion, and on hill sides all kinds of grape vines are found.

Grapes suitable to the location grow in all parts of the county; pawpaws, persimmons, crab apples, mulberries, red and black haws, hazlenuts, black and white walnuts, hickory nuts, pecans, blackberries, dewberries, gooseberries, raspberries, strawberries, and huckleberries in a few places.

There is but a small amount of government land remaining unsold in the county; only small parcels that have been overlooked and are of but little value. The southwest branch railroad formerly owned considerable in the northwest portion of the county, but I believe they sold the most of it at their land sales several years since. There are both large and small tracts, in the aggregate amounting to many thousand acres, lying in all parts of the county, that are owned by non-residents and speculators, which is much to the detriment and prosperity of the country, as a great many of said tracts are situated along our creek and river bottoms, and are the most valuable lands we have for general agricultural purposes.. There are also several large tracts, entered many years since for either real or fancied mineral value, many of which remain undeveloped.

The average price of land in the county is another hard question. Unimproved land in the western portion is from one to ten dollars per acre; in center, five to fifteen; and on the Mississippi river and Iron mountain railroad, some tracts have been sold as high as seventy-five dollars per acre. Improved lands are worth about the same, with cost of improvements added. Of course lands vary greatly, on account of location, accessibility, soil, mineral, etc.

Minerals are so extensive and various that it would require a geologist to give them. Geologically speaking, our county lies on edge, with dip to the north and east.

Some fifteen miles northeast, in Illinois, the coal fields commence; thence traveling southwest a few miles we strike the first sand stone, and on crossing the river at Platin rock, near the ancient city of Herculaneum, the second strata of sandstone or silex, suitable for the manufacturing of glass, crops out; thence further west a few miles we find the third strata, or old red sandstone; after which comes in the lead, iron, copper, and last granite, west of the Iron mountain a few miles. Limestone, in all its phases, lies interspersed in regular and confused masses among the whole.

Commencing on the east there has been a large quantity of sand taken out (for manufacturing glass) near Platin rock, and shipped mostly to Pittsburg, Pennsylvania, though considerable amount has been sent to Wheeling, Louisville, Steubenville, Beaver, etc.

Glass manufacturers say it is the best they get, when pure and free from dirt and foreign matter, being equal to the Ste. Genevieve quarries, which are equal to any in the world; being free from impurities and easy to melt, making clear and tough glass.

McPherson's marble quarries, near Sulphur springs, is fine building material, but have been but little worked, though I believe some of the fine fronts on Fourth street, in St. Louis, are from this quarry.

Traveling west we come to the lead mines. Some of the principal ones are King's trace, Gopher, Sandy, How's, McCormac's, Yankee, Valle's, Tarpley's, Mammoth, Frippell's and many others, in all of which there have been several million pounds of ore taken out. There have been many other prospects struck, and all of which, with capital, science and skilled labor, would be much more productive than they ever have been heretofore; the mining done being principally surface diggings, and done by persons of limited means and primitive tools.

Copper exists in many places, but has been worked but little.

Iron is found in many places, but on account of close proximity of Iron mountain and Pilot Knob, where it is in such abundance and pure character, the iron interest is entirely neglected. Geologically we are below coal measures, therefore have none.

There are symptoms of coal oil in places, but there have been no steps taken to prove it up.

Salt was made in several places in early times, but has long since been abandoned. We have several mineral springs, among which are the upper and lower sulphur springs, in the northeastern part of the county. Their medicinal properties in early settlement of country were much sought after, and with good results.

We have several good mills, though not enough to supply the demand for milling purposes. We have three steam grist mills, several steam saw mills, and a number of mills of both kinds propelled by water power; all the latter, with two exceptions (Cole's and Morse's), are on a limited scale and do but little business. A large portion of the wheat raised is sold in St. Louis, and farmers buy their flour. There is also considerable sent to Carondelet by the Iron mountain railroad, to be ground and returned in same way.

Although we have a large amount of suitable timber for lumber, which is needed in the county, yet pretty much all that is used for building purposes is brought from the pineries in Washington county.

Farming implements are generally of an ordinary character; no good articles made in the county except wagons and plows, which are manufactured at the different blacksmith shops. Drills, cultivators, mowers, reapers and threshers, are brought from St. Louis, but few of which have been brought into general use, except threshing machines, and they are generally of small size. The county being rough, roads bad, and country sparsely settled, with small crops, it does not justify to have large and cumbrous machines.

We have an agricultural society under way, but it was organized too late in the season to make suitable improvements of fair grounds to hold a fair this fall. It has been rather an up hill business organizing said society, on account of petty jealousies in the way of locating, and inactivity in agricultural affairs generally. We have a good many good practical farmers in their way, but they are situated so far apart that it is hard getting them together to compare notes and get general information.

The fair grounds are at DeSoto, on the Iron mountain railroad, and buildings contracted for to be finished in due season, and subscriptions raised to pay for the same. Should nothing intervene we expect to have a fair next fall that will be a credit to southeast Missouri. The directors are H. M. Parker, D. W. Bryant, C. S. Rankin, E. F. Donnel, H. S. Christain, M. A. Douthett, W. S. Dyer, Gus. Hamel and C. L. Gould. Some of the principal men in getting it up are John L. Thomas, J. W. Fletcher, E. Amoor, H. Kattleman, A. Yerger and others.

The Jefferson county horticultural society has been in operation a little over eighteen months, and has accomplished much good in the way of developing the horticultural advantages of our county, causing and increasing an interest in the community to grow fruit. Some of the principal spirits in getting up and driving the horticultural society ahead are as follows: Thomas Waker, H. S. Christian, J. E. Walker, Samuel Wright, Thomas Bettle, George Rapp, Benjamin Hiney, H. Bates, D. W. Bryant, Judge C. S. Rankin and others. They generally hold their meetings at the Victoria school-house, but occasionally move it to other places when more convenient. The Victoriaites deserve credit for the way they have taken hold of it, having been very liberal and hospitable, thereby getting up a general good feeling in the community; and in a few years, when they can exhibit specimens of their labor and care, it will be worth a visit for outsiders to attend the horticultural meetings. They have already produced some specimens of which they may well be proud.

This county took the premium at the St. Louis fair this fall for finest peaches and grapes.

The amount of land in cultivation in our county I think is hardly one-tenth, but is on the increase quite rapidly, especially favorable fruit locations.

The population of the county is between twelve and fifteen thousand, a large portion of which are German; the balance are divided between old residents and settlers from the more northern and eastern states.

Corn, wheat, rye, oats, barley, Irish and sweet potatoes, buckwheat, clover, timothy, Hungarian grass, apples, peaches, pears, grapes and garden vegetables, are the principal productions.

Butter and cheese making has only been carried on in a limited way, but with good success. Mr. Kierhoff, near Pevely, has carried on the manufacture of butter for several years, with considerable profit. He has near one hundred cows. I believe he is now making cheese.

Though our soil is adapted to growing the most superior article of wheat, the amount grown is not large; neither is the product great—by good farmers, say twenty bushels to the acre—but on an average not more than twelve bushels, all of which is fall wheat, and of the late kinds, except the bottoms, where May wheat is grown.

Subsoiling has been tried but by few, and with good returns. The drill is used on bottoms, but on uplands it is calculated to make the ground wash in gullies, the water following in the track of flukes, thereby washing up the grain.

Average yield of corn per acre, by good farmers, fifty bushels; general average twenty-five. Pretty much all kinds are grown; though, as we are not a corn exporting county, varieties have not been tested. A large portion is generally cut up for fodder, and fed to cattle after shucking out. Rye is not grown except for pasturage, and but a small amount of that. Oats are grown by all good farmers for home consumption, but none for export. Barley and buckwheat are only grown in limited quantities. Potatoes are only grown for home consumption, except in the northern part of the county for St. Louis market.

Sorghum grows on a small scale in all parts of the county. Many varieties are raised, though the black top or sorghum, red top or imphee, and gray top, have the best results. The black top would be best but for its blowing down, making it difficult to handle. Have not heard of sugar being made from it, though considerable is granulated at bottom of barrels. The old wooden mill for grinding, and wash kettles for boiling, are still used considerably, but the principal part is ground on cast mills ("Victor," generally), and sheet iron pans, galvanized, and Cook's evaporators, for boiling, are coming into general use. Upland is considered best, being sweeter and not so much een skimmings; though rich land is most productive.

Hemp has only been raised in two instances, to my knowledge, that grown by John S. Deaderick (an old Saline county hemp grower), on Platin farm, was a good article of fiber, from which he realized fifty-five dollars per acre over and above expenses of cultivation and breaking. Flax is entirely neglected.

Cotton was grown in small patches during the war, but was not considered remunerative, owing to want of implements for manufacturing, etc.

Tobacco is not in general cultivation, though it appears to do well. There are a few engaged in raising it, but I cannot say with what results.

There are a great many flocks of sheep in the county—generally of common breeds; yet there are some that are paying more attention to improved stock, and think it will pay. They are uncommonly healthy—a sick sheep is something almost unknown, unless from wounds by dogs or wolves. Wild pasturage good and extensive.

Timothy hay is generally grown for home consumption, and some for export. Clover is coming into general use for pasturage and enriching of lands, and is considered the greatest fertiliser where followed by wheat.

We have such an abundance of good fencing material that hedging has scarcely been tried. The Osage orange is grown by many around their yards as an ornamental shadetree (and it is a fine one), it producing a thick, glossy foliage—the leaves not dropping to make litter until frost, and it is free from insects.

This not being a corn growing country, hogs are raised only for home use. There is considerable interest taken in improvement of stocks; but the larger portion raised are descendants of the old rooter breed.

There is some attention paid to the raising of cattle, though principally of the scrub breed, as they are considered more hardy, being small and trim built, and easily take on fat. They are driven to the St. Louis market. There is some interest taken to improve by crossing with improved breeds, and with good results.

John O'Fallon, Jr., of Sulphur springs, has been trying the Bramah stock, and thinks them something extra, being easily kept in order (on account of their disposition to ramble round, finding the best pasturage, though always returning home), making fine oxen, being tractable, very quiet, and walking nearly as fast as horses.

There is more attention paid to the improvement of horses than other kinds of stock. The great demand for horses for government service during the war gave a stimulus to their improvement. The Morgan stock is mostly sought after. They are not as large as some other breeds, but better formed—being well muscled, and well adapted for both draught and saddle.

All the principal farmers are raising mules, more or less, both for home use and export. They contend that they are more profitable than horses, being less liable to disease, more hardy, requiring less care, coming to maturity sooner, and are more readily sold.

There have been several fine jacks brought into the county—some costing high prices, and all have been well patronized.

Fruit growing is the great business of this county, and the one on which we are running wild—overdoing the thing, etc. The more some cry it down the more others plant out. A few that cultivate negligently, cannot find any profit in it, while others, more industrious and thoughtful, believe it more remunerative, taken as a whole, than any other business they can go at.

There are a few old orchards, planted by the first settlers many years since, that are on indifferent situations, that still bear good crops. They are generally seedlings.

Peaches have never been known to fail, except after the cold winter of 1864. I have no correct

data, but from best information at hand, there were at least one hundred thousand trees planted out last fall and spring, and we are prepared to plant out still more largely this coming season.

As to overdoing the business, it might be done if St. Louis was our only market; but as the whole country north of the 40° of latitude is uncertain for most of fruits, Iowa, Minnesota, Wisconsin, Nebraska and northern Illinois will all be markets when we can furnish them, which will be when the railroads are extended north. It has been successfully demonstrated at Hermann, that it is the most remunerative business that they can follow; and if so there, why should we not succeed, when we are from a week to ten days earlier, which is the cream of fruit growing?

I believe that upward of one hundred and fifty acres of vineyards have been planted out, though nearly all within the last three or four years; consequently are too young to form a correct estimate of annual product. The kinds mostly planted are in about the following order, viz: Concord, Virginia seedling, Herbemont, Catawba, Hartford prolific, Taylor's bullet, Clinton and Delaware. There are a few of pretty much all other kinds planted out—as an experiment more than an expectation of profit, some of which have done well, while others were labor in vain.

Our county can hardly be called an agricuitural section generally, but for horticulture it cannot be excelled, if equaled, by any other portion of the state, taking soil, climate and proximity to market into consideration. Some wishing earliness in crop, would think of going further south, but they would lose more in altitude than they would gain in latitude, besides the loss in market facilities.

As I sent you a list of the principal fruit growers and vintners, I will not repeat it here.

In conclusion, I will say that I should liked to have given some statistical information, but what little I did get was so unreliable that I omitted it altogether.

Yours, respectfully,

W. S. JEWETT,

Secretary Jefferson County Agricultural and Mechanical Association.

JOHNSON COUNTY.

RAMEY, Mo., November 8, 1866.

To Dr. L. D. Morse:

DEAR SIR: Agreeable to request I send you what little information I am able to give on the subject of agriculture, etc.

I don't know that I have anything new to offer on the subject of fruit growing since my former communication. In the name of the apples that I reported as a good variety, I aimed to write Kirby red instead of Kinly red, as printed in the agricultural report, on page 125.

In the description of the county there was one thing I neglected—the water. In some parts of the county there are many good springs; in other parts there are but few. For family use, wells are generally preferred. The best of water—mostly limestone—is found by digging from twenty to thirty-five feet. Some persons dig more, and some less.

The health is, I believe, as good as in any part of the United States, where so large a coat of vegetation grows. It is true that some seasons we are subject to chills and fevers, while in other seasons we almost entirely escape. I believe that with proper care but few need suffer from chills and fever. I have lived in this county since the spring of 1843, and have had but two chills. I have all the time had a large family, but they have suffered very little in that respect. We have always attended to our business as other farmers, but have generally been careful. From my own observation, all who have been careful have suffered but little, while those who have been careless have sometimes suffered a good deal. This fall, with a few exceptions, the people have been as healthy as people well could be.

As to the freed people, there are not a great many here. A large portion of them went to Kansas in the early part of the war, and a great many others were taken south by their owners. Some few have since returned from the south and Kansas. As far as I have been able to ascertain, a few of them are not doing as well as might be desired; while others, I think a large majority, are doing as well, if not better, taking everything into consideration, than some of their former owners. Some of them, who are getting along in years, are trying to get a common school education, and I believe that all I know are doing a good part toward having their children educated—equally as much if not more so than the whites.

Twelve months ago the western part of this county had but few inhabitants; a large portion of the people had left during the war. What few remained had raised but little produce. Many of the fences around the farms had been burned and some of them jayhawked. Some of the houses had been burned, and many others gone to wreck. But within that time a great radical change has taken place. I think we have at least three times the population we had one year ago, that is, in the western part of the county, and I am of opinion that the population has increased over fifty per cent., taking the whole county together. We will have an ample supply of provisions—I mean the necessaries of life—for the present population and as many more as are likely to come among us, if it should not be more than double our number.

Farm labor is worth fifteen to twenty-five dollars per month; the employer furnishing the employe board, lodging, washing, etc.; day laborers, from one dollar to one dollar and fifty cents per day, and some as high as two dollars per day. The wages are governed pretty much by the kind of labor to be performed and the urgency of the case, and the skill and ability of the laborer.

This year's crop of grain, I suppose, will be about an average yield per acre in the western part of the county; in the eastern part, it is not so good, on account of the severe drought. The same may be said of potatoes and garden products. The apple crop is abundant. For good apples, I suppose the average price is about fifty cents per bushel for choice varieties, in the orchard. We have had no peaches this season that I have seen. Other fruits have been so little attended to that I consider it unnecessary to try to make an estimate.

The army of grasshoppers, coming from the west, made their appearance in the western part of Johnson county about the 10th of October. They have now advanced, I believe, about six or seven miles into the county. The cold weather we have had does not seem to diminish their number (they appear to be increasing rapidly each day), though it seems to considerably retard their advancing progress. I have heard of their doing no damage, further than injuring—perhaps destroying—a few wheat fields, and the cabbage and turnips in some gardens; while, in others, the injury seem but trifling. They seem to be very fond of good apples. They are boring holes in the earth and depositing large quantities of eggs.

Respectfully,

B. HORNSBY.

Dr. L. D. Morse:

RAMEY, JOHNSON COUNTY, MO., December 26, 1866.

DEAR SIR: Your circular of December, 1866, was received yesterday afternoon, requesting information as to the past season, crop of fruit, corn, wheat, hay, etc.

The spring was very wet and cold, and it was very difficult to get corn and other crops in on account of the land being too wet to work. Owing to the coolness of the temperature and dampness of the ground, it was very difficult to get an early stand of corn and other crops. The fore part of the summer was wet and cold, owing to which it was difficult to cultivate the crops. The latter part of summer was hot, and in most localities very dry; and, in other localities, not so dry, though in all sections of the county crops suffered more or less with the drought—that is, such as mature in that part of the year. We had a few very hot days, though I think that on an average the season would be considered cool. The atmosphere was generally damp. My recollection is, that there have been fewer thunder storms than usual.

Rains commenced, I think, about the first of September; since which time the ground has been wet enough. A tolerably severe frost, about the 20th of September, killed or damaged nearly all late corn, peas, beans, etc. With the exception of the above named pest, the fall was of agreeable temperature, with the exception of damp atmosphere and frost. The first snow fell about the 15th inst.

As regards the fruit crop, there was a full crop of apples; I think a good deal over an average, of excellent quality. As to peaches, they were almost an entire failure; I do not suppose there was a bushel raised in Johnson county. I have understood that, in the southern part of Henry county, and further south, there were good crops of peaches. But few pears raised in this county. Few grapes were cultivated in this section. Those cultivated generally do well; but I believe they have been a failure, or nearly so, the past season. The native grapes generally do well. They have, so far as I know or have heard, been a failure. I cannot say as to the cause of failure. Since the war ceased, people are beginning to look about to increase the cultivation of fruit—especially the late immigrants. In fact, many have already planted large orchards of apple and peach trees; some have planted vineyards. I will here state that it is my decided opinion that no part of the

United States is better adapted to the growth of apples, grapes, strawberries and most other small fruits than Johnson and adjoining counties; but I believe there are other parts better adapted to the growth of peaches and pears, though they do very well here when properly attended to.

As regards the relative condition of corn, wheat, oats, barley or hay, I have to say that the four latter (except barley, and I don't know of any sown), this year, on an average have done better than corn. They have been as good as could reasonably be desired, except wheat—and that was as good as could reasonably be, except that it was, in some fields, rather thin on account of being killed by winter frosts. No reasonable person could wish or expect meadows to have been better than they were last season. There is certainly no part of the globe that produces better crops of hay than timothy and clover sown together on the prairies of this county when the season suits. I have a piece that was sown eight years ago, and got a better crop last year than I ever mowed. Timothy, without the clover, does not last so well. In some localities corn is very light, on account of the drought in the latter part of summer; in others, it is better, as rains fell more copiously; but all suffered more or less. Upon the whole, taking corn, wheat, oats and hay together, I think we have a good average crop compared with prior years.

Garden products generally good. Cabbage better than usual. Turnips, excellent. Sweet potatoes, as firm as could be expected in this climate. Early Irish potatoes, good. Such as were planted to mature in latter part of July and August, worthless; late planted, as fine as ever I saw—but owing to the constant rains in September and for part of October, or from some other cause, a great many have rotted, especially the neshannock. Peachblows some little rotten, but not so much as the neshannock. The peachblow and the neshannock are the only varieties that I know of being grown to any extent in this section.

In regard to hay, I will state that we, in this section, never think of having less than an ample supply, provided we will save it. There are thousands and tens of thousands of acres of wild prairies that will yield from one to two, three and four tons per acre. Though not so good as timothy or clover, it will answer very well to keep stock through the winter.

Respectfully,

B. HORNSBY.

KNOX COUNTY.

November 5, 1866.

Dr. L. D. Morse:

DEAR SIR: In accordance with a promise made to you, I now undertake to give you the general character of Knox county, especially in reference to her agricultural condition and prospects.

Knox county is situated in the northeast corner of the state and forty miles from the Mississippi, and with Scotland county lying between this county and the Iowa state line. Nearly two-thirds of the land in this county is prairie—nice rolling land—all of which can be made available for agricultural purposes; the balance is nearly all good timber, with some brush land. The timber land is mostly situated on the streams, and conveniently situated for use on the prairies, or where-ever needed.

Knox county is well watered. The Fabins rivers—north, middle and south Fabins—all running across the county, with other minor streams, well located to supply plenty of stock water. Springs are not plenty, but living water can be had on most farms by digging.

Our timber land is generally rolling, and sometimes hilly; but the prairies are beautiful in their appearance and susceptible of the highest state of cultivation, and can be made to teem with magnificient crops when the season favors. No county in the state presents better facilities to the industrious farmer to become independent of want.

The principal timber is white oak, hickory, walnut, birch, ash and cottonwood.

No minerals of consequence discovered, except limestone—a good supply; and good indications in some localities for coal oil.

Several mills on the Fabins, besides steam sawmills in six or eight localities. A fine woolen factory in Edina, our county seat, commenced operation this summer, by Mr. John Winterbottom, with three hundred and sixty spindles; works well and will be a success.

No agricultural society in our county. One at Newark before the war, and we trust will be renewed next year. While in operation it done great good in encouraging the raising of fine stock.

There is no government land in our county, and speculators' land is rapidly selling. The most of our land is owned by residents, which has proven decidedly advantageous to our prosperity. I think not more than one-tenth of our land is cultivated. The principal products are corn, oats, wheat and hay. Owing to our climate and bad system of putting in wheat, we do not raise much wheat, especially fall wheat. Our farms are generally all fenced in. Not fallowed, pastured and tramped, the ground becomes loose, foul and infected with insects. When our mode of farming is changed, we will raise more and better wheat.

Corn does well. A great deal is planted, and the yield is on an average thirty bushels per acre, under a very poor system of cultivation. One hand is expected to cultivate thirty acres, and of course it is poorly cultivated. Of a good average season, where corn is plowed four times, we will raise fifty bushels per acre. Our corn is fed to hogs and cattle; besides, we find it profitable to raise mules and horses fed on corn.

Rye, oats and potatoes grow finely, but owing to having no markets, no overplus is raised. A railroad running through our county would make a great change in the raising of these articles.

Enough sugar cane is raised to supply home consumption in sorghum molasses, and of a good quality.

Hemp, flax and cotton are raised to a limited extent. Some flax for the seed, yielding ten bushels per acre.

Tobacco does well, and is raised to a limited extent on hazle soil.

The grapes do well. Timothy, clover and Hungarian are excellent.

The people have commenced raising hedge fence. The Osage orange does well.

Hogs have been raised in great numbers until within the last few years. The hog cholera has injured us much, but is passing away again.

The raising of cattle is a specialty in Knox county, and has been the most profitable thing engaged in by the farmer. We have a fine variety of good blooded cattle, and cattle buyers from Illinois pay us high prices, and are anxious for Knox county cattle. None slaughtered at home for market. None raised for breeding, especially for the dairy. But there is no other locality better suited for that business than our county can afford.

A great many horses are raised in this county, and sold in the markets; but we have no good breeds—usually too small. The last year a few large stallions have been brought into northeast Missouri. I would mention one owned by Major David McKee, of Clark county. These remarks are suited to the counties of northeast Missouri. Mules are also profitably raised in this county. We have some fine jacks, which have generally been brought from Boone county, Missouri.

Within the past few years there has been but little attention paid to fruit raising. It was thought by old fogies that we could do but little good at this business, and in consequence our fruit was hauled mostly from Illinois, or from Marion or other counties in this state. But for a few years last past, a great deal of attention has been paid to fruit nurseries, and to planting all kinds of fruit trees, consequently the old notion is dissipated, and in a short time we will have an abundance of the very best varieties of fruit, as we plant none but the best. I think we have been imposed upon by eastern nurserymen, as my experience is that trees raised in nurseries here are the most hardy and profitable, and can be transplanted with much less injury to the tree.

There is a good deal of attention being paid to wool raising in this county. Many more are paying attention to this branch of business, and find it to be profitable. Mr. Daniel Egleston, of this county, tells me it will pay well after a fair trial. I would like to say more on this branch of my report, if the space allotted to me would admit. In a general way I will say that, with the fine woolen factory now in operation in our county, and the good prices paid for wool, together with the unsurpassed adaptation of our land for raising sheep, added to the quality and breed of our sheep, no place in the west can be more attractive to the shepherd.

The grape vine has been tested sufficiently in this county and in this part of the state, to prove the adaptation of the vine to our soil, especially our hazle land, and is bound to become a profitable business at some future day.

The great drawback to our enterprise as farmers in Knox county is, we have too much land for the number of our population. Farms too large, and consequently not well cultivated. But time will remedy this. Again, from the same cause, shallow plowing, and no use made of manure. It is said by many that the land is too rich—that it does not need manuring, and yet I have never seen land improved more by its use in maturing crops.

A bright day is dawning also in this respect. A bright future awaits us. Farming machinery is being brought into use. The improvement in plows is very noted, both in respect to scouring and durability.

Reapers and mowers are more in general use; some fifty being sold in this county the last season. The Ball, Buckeye, Manny and McCormack work well. Common hands on the farm are getting one dollar per day, and boarded by the month, and higher in harvest times—hands scarce. Under our new school law much interest is exerted in reference to schools. Teachers are scarce, but of a better grade than heretofore. Wages in the county, forty dollars per month. At Edina we have two seminaries of learning, one under the control of the Catholic church, and one under the Protestants, both in a prosperous condition. New fields are opening in the cause of education.

We have but very few freedmen in our county, and most of them are in town, and seem to be making a living. Laborers are much needed, and I have been spoken to often in reference to foreign laborers. Many farm hands could do well to come here immediately, and a few good hands to take care of sheep.

The war nearly ruined our prospect, but things have revived wonderfully under our change from a slave to a free state. Emigrants of a good class and of means are now settling among us, bringing with them energy and industry with their skill and scientific attainments. We welcome them heartily.

The price of land has been very low, but is advancing. Improved land is now worth from ten dollars to twenty-five dollars, and unimproved at from seven dollars to fifteen dollars, according to quality.

We have a charter for a railroad from Keokuk, Iowa, through our county to Macon City, to connect with the North Missouri railroad.

Our crops this year are good in general. Corn was injured by the grub worm; seriously in some localities.

WILLIAM M. BEAL.

REPRESENTATIVES' HALL, JEFFERSON CITY, Mo., January 8, 1867.

Dr. L. D. Morse:

DEAR SIR: On the eve of leaving home, Knox county, Missouri, for this place, I received your circular, and at this, my earliest convenience, I send a hasty reply.

The year 1866 commenced in north Missouri very cold, and in February snow fell to the depth of sixteen inches, which laid on the ground nearly one month. We had a wet, cold spring in Knox county, causing considerable seed corn to rot in the ground, and kept wet until the 10th of June, consequently the corn crop was not cultivated as much as it should have been, but had the effect to give us the best grass crop for many years; and having had fine weather to make hay, we had an abundance of the best quality of hay. We raised, in fact, abundance of everything, but the frost coming about the 18th of September injured our corn much in weight. Our fruit crop was cut short by late frosts in the spring.

The people generally are setting out large sized orchards of cultivated fruits, but generally the trees have just commenced bearing, and are tender and easily injured by freezing. I noticed wherever the trees are of large size and of some age they were not killed by the frost.

We are experimenting on the grape considerably; very few raised last year; where the vine was laid down and covered during the winter the grape did well. The cultivation of fruit of every kind is increasing very fast.

I think, take all our crops together, the one for 1866 will not fall far below a medium one, and as stock of all kinds was sold off a little too bare last season, on account of high prices, we will have abundance of grain and hay in Knox county, and some to spare.

Barley has never been raised in our county sufficiently to test its value.

We raised the finest crop of vegetables last year I ever saw. The potato crop, however, was injured by the rot, caused by the wet, warm weather. Potatoes dug a few days before the wet weather kept nicely.

I trust you may collect much valuable information, which will be of immense advantage to our people when notes are compared.

With high regard, I am your humble servant,

WILLIAM M. BEAL.

EDINA, KNOX COUNTY, MO., January 14, 1866.

L. D. Morse, Esq.:

SIR: Mr. J. S. Bennington handed me a circular letter, which he requested me to answer, which I will proceed to do as follows, to wit:

The spring opened very favorably, and was dry and pleasant. About the first of May it commenced raining, and became very wet, and remained so until the middle of June, which interfered with planting the late crops, and also with plowing; after that time it became rather dry, for several weeks; in the latter part of July there were frequent rains and thunderstorms. The corn crop continued growing until the latter part of September, when there came an early frost, which cut short the corn crop fully one-half. The peach crop was an entire failure, there being none in the county. The apple crop is about one-half crop. There are but few grapes cultivated in this county. The few that are cultivated within the county did not produce more than about half the usual crop the last season. Generally they do well. They do not, as a general thing, suffer much from blight or rot when they are properly attended to. The cultivation of fruit is attracting general attention, and is very rapidly increasing.

There is but little wheat raised within the county, and no barley. The oat crop was very fair—better than usual. The hay crop was largely over an average one.

The fall and winter months have been very fair.

Very respectfully,

SAMUEL M. WERT.

LAFAYETTE COUNTY.

BY W. W. GAUNT.

Lafayette county lies on the south side of the Missouri river, and is the second county from the western border of the state; having Jackson county on its west, between itself and Kansas. Ray and Carroll counties are on the opposite side of the river. Saline county bounds it on the east, and Johnson on the south. It is about thirty-three miles in length from east to west, and about eighteen miles in breath from north to south, having a river front of about forty miles.

The city of Lexington, the county seat, is situated on the river, on a high bluff about twelve miles from the western boundary of the county; it has a population of about 4,000; has a good and roomy court house and offices. Its jail has been burned, but is now being rebuilt in a very substantial manner. It has several very flourishing churches and schools. The Methodist (south) have a large and splendid edifice. The Baptists also have a large and elegant structure, but not entirely finished off. The Presbyterians, Episcopalians, Cumberland Presbyterians and Christians have good and commodious houses, and their meetings are well attended. The Catholics also have a chapel, and a resident priest.

Besides the public or free schools, we have many private schools for small children; a select high school for females; the Lexington female college, under the charge of Rev. E. S. Dulin; the Elizabeth Aull institute, under R. W. Finley; the military and collegiate institute, under Prof. G. K. Smith; and a school under the special charge of our German citizens.

A large number of persons are engaged in commercial pursuits; and all, apparently prospering. We have three banking houses, two foundries (and another projected), two large flouring mills, several saw mills, agricultural implement factory, several agricultural warehouses, tobacco manufactory, wool carding factory, three weekly newspapers, a good supply of physicians, lawyers, insurance and real estate agents, artists, drug stores, book stores, jewelry stores, confectionaries, bakers, etc.

We have several flourishing little towns in this county.

Napoleon, in the extreme northwestern corner, is a shipping point; has a store, postoffice, etc.

Wellington, seven miles west of Lexington, is a very thriving town, with an intelligent and cultivated community in and around it; is the shipping point for the western part of the county; has several stores, and other business houses, with a considerable trade; has churches, good schools, physicians, etc.

Berlin, eight miles east of Lexington, is also a shipping point; was, before the war, a place of considerable business; has yet a very large and commodious warehouse for baling and storing hemp, etc., which has now resumed business; has a store, sawmill, resident physician, etc.

Dover, two miles southeast of Berlin, and ten miles east of Lexington, is a flourishing town; has several stores, churches, schools, physicians, etc.; is the center of a large trade, and surrounded with a wealthy and cultivated people.

Waverly is an incorporated town twelve miles further east, and near the eastern border of the county; is a considerable shipping point, and has a large trade with the eastern part of this and the western part of Saline county. It has several dry goods stores and other business houses, several brick churches, good schools, several physicians, etc. All these, except Dover, are on the river.

Greenton, a small village twelve miles south of Lexington, is in the midst of an intelligent and wealthy community; has a store, postoffice, blacksmith and wagonshop, two churches, a good school, two physicians, etc.

Mt. Hope, four miles further south, has a store or two, postoffice, physician, etc.

Chapel Hill, in the southwest corner of the county, has a store, a good school, a resident physician, etc.

Mayview is about ten miles south southeast from Lexington, on the road to Warrensburg; is a stage stand, has a postoffice, etc. This is a village but recently laid out. There are also two flourishing stores in the southeast part of the county, in the midst of an industrious and energetic population, mostly Germans. There are also several churches and postoffices, in different parts of the county, in convenient localities.

This county has long been noted for the richness of its soil, the excellence of its water and climate, and for the wealth and refinement of its citizens; and has some of the best and finest residences and farm houses to be found in the state. Lands near the city and near the river command high prices, graded according to its situation and improvements; but in the eastern, southeastern, southern and western parts of the county excellent lands can be had at very reasonable prices. Many of our large prairies are well set with blue grass, and afford superior advantages for stock raising and grazing.

Our timber is abundant, and of various kinds; oaks, walnuts, hickories, elms, black and honey locust, ash, hackberry, mulberry, linn, cottonwood, etc. The undergrowth is principally hazel and sumach. The various wild fruits are grapes, hazelnuts, pawpaws, etc., and are very abundant.

Our county is well watered in all parts, having the Sni coming in from Jackson county, running a northeasterly course, and emptying into the Missouri river half a mile east of Wellington. It has a branch heading in the southwestern part of the county, between Mt. Hope and Chapel Hill, running north and emptying into the Sni a short distance above its mouth. The Little Sni, heading westward of Greenton, runs north into the Missouri, below and near the Sni. Tabo heads south and southeast of Mayview, runs a northerly course, and empties into the Missouri above Berlin. David's fork heads westward of Mt. Hope, runs easterly through the county, and empties into Blackwater river. The Salt fork of Lamine has its source in the eastern part of the county. There are also many minor streams throughout the county, tributary to those named before; thus affording abundant water for manufacturing purposes.

Coal is abundant in nearly every part of the county, and is of excellent quality; it is especially abundant in all the river bluffs. Large quantities are now being mined above Lexington, conveyed to the river by railroad, and shipped to points above.

As yet, we have no railroad connection with other parts of the country; the nearest roads being the Pacific, south of us, and the Hannibal and St. Joe to the north. But the Missouri valley road is now being built, and will probably be in running order in a year. This road will connect Lexington with all roads east and west.

Our principal crops are hemp, tobacco, corn and wheat. The quantity of hemp shipped from this county has always been very large. It is yet raised in considerable quantities, but not so largely as before the war; and will cost considerably more than formerly to put it into market; the item of breaking and clearing alone now costs from one dollar and fifty to two dollars per cwt., and may, before spring, cost more. Probably more tobacco will be raised than formerly. There will not be such large yields of it, however. More persons will be engaged in its culture, and perhaps many of them inexperienced in its management. Considerable quantities were lost or injured this fall, by the rains and early frosts, yet the quantity to go forward to market will be large, and much of it of excellent quality. The yield here per acre is large. In the fall of 1865 there was probably a larger quantity of wheat sown, than had been for many years before; and its yield and quality were highly satisfactory. I hear of no fields bringing less than twenty-five bushels to the acre; the most of them yielding about forty bushels per acre. The present fall there has, I learn, been a larger quantity sown and another handsome yield is anticipated the next harvest. We have always had a full supply of corn, and it is generally consumed at home; a shipment of corn from this county being a rarity. During the past year, however, large quantities have been exported to

Jackson, Cass, and some other counties, to supply the wants of those who had returned to their homes too late to refence their fields and raise a crop. The yield of corn per acre is always large and proportioned to the amount of culture. Oats, rye and barley also yield large crops; our last crop of oats being very heavy, and of good quality. The various sugar canes now in use appear to be at home here; grow finely, and give a large yield of rich juice. It is not raised as a crop for export, yet every farmer plants more or less for his own consumption. Flax grows well; gives a fair supply of seed, and its fruit is of excellent quality. It has not been raised to any great extent until the last spring, when some of our farmers planted a large amount of ground with it, principally for the seed; one, I have been told, put in about sixty acres, but I have not been able to learn the result, whether profitable or not. Could the seed have been procured in time, many of our farmers would have experimented this year with the castor bean, but the result would hardly have been satisfactory, owing to the early frost and frequent rains during the fall. Vegetables of all kinds grow well, and give abundant returns.

This county is exceedingly well adapted to the raising of most kinds of fruits. Of apples we have a great abundance. Nearly every farm has an orchard on it, and the young orchards especially, are of well selected varieties. A failure of the crop is very rare. This fall we have furnished large quantities for export to Kansas, Nebraska, etc., and at very satisfactory prices—from 60 cents to $1 00 per bushel, in the orchard. The extent and number of orchards will be largely increased this fall and next spring.

Pears of good qualities are rather scarce as standards. In the last few years much attention has been bestowed on the dwarfs, and at considerable outlay of capital. In nearly all cases they were doing well, when they had proper care, and were producing very satisfactory results. Our people were beginning to revel in the luxury of fine, luscious pears; but I am sorry to say that a great many dwarfs are now beginning to die, just as they were beginning to be a source of profit and great pride to their owners. I have no doubt, however, but that we will be entirely successful with standards of the same varieties. The fault does not appear to be in the climate so much as in the system of dwarfing—the draft appears to outgrow the stock.

With peaches, we, in common with a large part of the western country, had a failure this year, yet not an entire failure; for a tree here and there, in protected situations, would be seen with a pretty fair crop. In the extreme southwestern part of the county they were, comparatively, plentiful. Many trees of the finer varieties have been planted, and have done well; but the larger proportions of our orchards are seedlings, yet of very good qualities, and usually we have very abundant crops.

With plums we have not been so successful, probably from want of proper care. Our wild plums are very plentiful, and rarely fail. The Chickasaw is found in most of our gardens and orchards, and produce well; but the finer varieties have not yielded satisfactory results. The curculio is, as usual, the greatest plague.

With the Morello and other hardy kinds of cherries we succeed well, but not with the finer varieties. It may be owing to their rampant habit of growth, checking fruitage; and this may by careful study and experiment be obviated.

Quinces grow well and produce finely, but we have but few trees.

The small fruits all do well, excepting, perhaps, the raspberry. The canes of the Antwerps and other tender kinds need protection during the winter. If well protected, I am convinced they would give more satisfaction. Probably the improved black cap and evergreen might do well without protection. I have not heard of their being tried here to any exient.

Blackberries are so numerous and fine in the wild state, that no one appears to cultivate them, except to leave some "patches" to grow at random, in a corner of a meadow or old field.

Strawberries are cultivated in almost every garden with but little trouble. They are, also, very fine and abundant in the wild state, being found in great quantities on our prairies.

Currants do as well as if they were natives of our county; yield abundantly and are of good flavor.

The grapevine flourishes here; but as yet we have but few vineyards, and those small ones. Scarcely any kinds have been tried but Catawba. They have borne some fine crops, but failed this year, caused by the vines freezing last winter. Some Concords and other varieties have been planted lately, but we cannot speak knowingly yet of the result. There is no doubt, however, but that this county is well adapted to grape culture.

Our climate is not subject to such great extremes as some other localities where there is less timber. The summers are not so hot, nor are the winters so cold. Some of our farmers, who have inclosed pastures graze their cattle on the prairies until about December, and then winter them well in the pastures, with but little feeding or protection.

Cattle, horses, sheep and hogs are raised with but little trouble, and are very healthy and thrifty.

The people, too, are very healthy and vigorous.

The water is excellent and abundant. We have living springs and lasting wells, of both soft and limestone water. Cisterns for rain water are easily and cheaply constructed, and are very durable.

Building material is abundant and of excellent quality, both sandstone and limestone.

Laborers are in demand, especially reliable white laborers, and the wages are good. The freedmen are not reliable yet as farm hands. They will congregate in the city, and cannot be induced, generally, to go any distance in the country. Within three or four miles of the city they can be had as day laborers at from 75 cents to $1 50 per day, with their meals—they coming from the city in the morning and returning at night. They appear very reluctant to engage for any length of time.

LAWRENCE COUNTY.

MT. VERNON, LAWRENCE CO., MO. December 28, 1866.

To Dr. L. D. Morse:

DEAR SIR—Yours of the 20th is at hand. In reply to your circular as commissioner of statistics, I would say that the spring was very wet and cold, the summer dry and warm, autumn delightful and seasonable.

There was about the usual number of thunder storms. The first frost to kill vegetation occurred on the night of the 20th of September, five days earlier than ever before known—the usual time being from the 1st to the 15th of October.

The fruit crop has been moderately good this year. Apples average ten-tenths (last year eight-tenths); pears will not average seven-tenths (last year ten-tenths); peaches will not average seven-tenths (last year five-tenths); cherries average ten-tenths (last year eight-tenths); grapes, wild, average less than nine-tenths (ten-tenths).

Grapes are as yet but little cultivated. The Isabella has been cultivated for several years by Nathaniel Wheat, near Marionville, in the southeastern part of the county. The few vines he has did well in 1862; were injured by the excessive cold of January 1863, and grew rapidly the following season. In 1865 they bore an excellent crop, but the wet weather of the last spring probably caused them to rot very much. The cultivation of fruit is largely on the increase.

Corn is below the average, seven-tenths (last year ten-tenths); wheat, nine-tenths, (last year eight-tenths); oats, above the average, eleven-tenths (last year, eight-tenths); hay, ten-tenths (last year, nine-tenths). No barley cultivated.

Vegetables were generally below the average crop, on account of the summer drought, and below that of last year, except early potatoes, which were eleven-tenths (last year, nine-tenths); late ones seven-tenths.

Most respectfully,

J. W. BLACK.

LIVINGSTON COUNTY.

BY J. H. DRAKE.

The city of Chillicothe is the county seat, and is situated near the center of this county, and immediately on the Hannibal and St. Joseph railroad, 131 miles west of Hannibal on the Missouri, and 76 miles east of St. Joseph on the Missouri. The city of Chillicothe contains a population at this time of 3,300, and its central locality makes it really the first point for trading, as well as the commercial point of the whole section of country lying north for a distance of over 80 miles, extending some distance in the state of Iowa. The merchants and commission houses of this city are doing a large wholesale and jobbing business. The population of the whole county is 10,200.

The county of Livingston is bounded on the west by Caldwell and Davis, on the south by Carroll, on the east by Linn, and on the north by Grundy.

The length of the county from north to south is twenty-four miles, and on the south end, east and west, is twenty-six miles, containing 336,500 acres of land and 530 square miles, making fourteen full congressional townships, three half townships and a fraction over.

There are no government lands in this county. The larger portion of the unimproved lands are owned by the Hannibal and St. Joseph railroad company, situated immediately on both sides of the railroad through, this county from east to west. About 60,000 acres of wild lands are owned by non-residents. The greater portion of the lands are now in market; the price ranging from four to twelve dollars per acre. The railroad company lands are being sold at from four to sixteen dollars per acre, for cash, or on long credit. The average price of their good land would probably be about nine dollars per acre.

Improved lands are ranging in price from twelve to thirty-five dollars per acre, depending on improvements, locality, etc. Not more than one-fiftieth part of the county is under fence; the balance is open prairie and timber, mostly covered with grass of an excellent quality for stock.

Stone is found in great abundance in many parts of the county, more particularly along the numerous streams and water courses, which are so abundant in this section. The larger proportion is sandstone, yet in the western portion of this county the limestone underlays the whole surface, which is used for buildings, burning into lime, and in fact for all practical purposes which limestone is used for.

Coal abounds in the vicinity of Bedford; is taken out in large quantities and with very little expense. It is known to exist over a large tract of country, as it is found in most of the branches and ravines, and believed to be inexhaustible, and is seen cropping out of the banks of Grand river for a distance of fifteen miles. The Bedford coal is used by our blacksmiths as well as our citizens, and pronounced a good article. Coal is also taken out near Utica, five miles west of Chillicothe, in considerable quantities, and finds its way into our market. Coal mines west and north of Chillicothe five miles, near Grand river, have just been opened. One mine on the farm of Judge Cox has been worked for some years, and has a very flattering appearance. Coal on Medicine river is seen in the banks for a long distance. In fact, coal is found in nearly every portion of this county. It appears to be the opinion of practical, experienced men that the section of country in the vicinity of Bedford has every indication of a coal oil region, as yet not fully tested. A company are now boring for oil a few miles south of Bedford.

The Hannibal and St. Joseph railroad company are reserving oil, minerals, etc., on certain tracts of land when sold in this section.

There are but few grist mills in this county, and those few are doing strictly a custom work, and that in a great many instances very imperfectly. There are a number of grist mills in course of construction, which will probably give better satisfaction to their customers.

Saw mills are scarce and few, and cannot supply but a small portion of the lumber used. A large proportion of the building materials used here as well as in the vicinity of Chillicothe is transported by rail from the Mississippi at Hannibal, Missouri, and necessarily high prices rule.

In the present year, 1866, a large amount of agricultural implements have been introduced in this section. A large proportion of them is manufactured in the states east and north of Missouri, notwithstanding St. Louis has furnished a very fair proportion.

The Moline plow, manufactured at St. Louis, appears to be a favorite, and is used by many farmers and gives good satisfaction. The Garr plow, manufactured in Chillicothe for some years past, has its advocates, and no doubt does its work well, and many other patterns now in market, manufactured east of here, do well. The double shovel steel plow is in general use for working corn, and appears particularly adapted to the wants of all our small farms. Where the fields are small it requires a great deal of turning, as the corn rows are short. In the larger fields where the rows of corn are larger, the sulky plow is more adapted to the wants of the farmer, and can do more work in a given time than the smaller plows, and appears to be a favorite plow and works well.

Mowing machines are now in general use. Very little grass is cut with the scythe. The Hubbard, Buckeye, Cayuga chief, Wood's iron mower, Manny's and a number of others of the latest patterns are now in use, and most of them give good satisfaction. There are a few combined machines introduced this year, 1866, in this county, of the last patterns, which have not been fully tested, but have every appearance of working well, and no doubt will. The Victor cane mill and Cook's evaporator are in use and work well.

In almost every instance where winter wheat has been sown about the first or second week in September, on limestone or timbered lands, the yield has universally been excellent; not less than twenty bushels to the acre, and not uncommon to get twenty-five or thirty bushels. In many instances where winter wheat has been sown on the open prairies, distant from timber, without the necessary protection, the yield has frequently been small—in many instances not worth harvesting.

Spring wheat, when sown late in the spring, necessarily is a few weeks later in coming to maturity than winter wheat, and is frequently eaten up by the chinch bugs. But when properly put in the ground, in the months of February or March, the crop has been a certain one.

Oats is a favorite crop and is raised in large quantities on most of the farms. The average yield is about forty bushels, and a certain crop, with good culture. Sowing broadcast appears to be the popular way of sowing all small grains. Wheat drills have just been introduced.

Corn is raised on every farm, and no doubt pays better than any crop. The yield is about forty-five bushels to the acre, notwithstanding farmers frequently claim sixty or seventy bushels, and no doubt frequently get it. The yellow and white gourd seed corn are the varieties cultivated by our farmers. The yellow has the preference for feeding all stock, yielding more to the acre, and not so hard and flinty as the white variety. The white corn is used largely for bread and family use, and is some weeks the earliest variety. The corn crop is fed to hogs and cattle, and shipped on the cars either to Chicago or St. Louis. The hogs slaughtered here principally find a market in the western territories, for the mining regions.

Rye is cultivated in all localities, and as a general rule produces about thirty bushels to the acre, and is particularly adapted to our deep prairie land.

Buckwheat is a paying crop, as a general thing yielding about forty bushels per acre; yet it exhausts the soil more than any of the smaller grains.

Potatoes grow excellently in all localities and produce about one hundred bushels per acre. In the year 1865 a large amount of the potato crop rotted in the ground, and in many instances after they were sold in market. The potato rot is not confined to any particular variety but affects all alike.

Sorghum yields about one hundred and twenty gallons to the acre. Grows best in the timber or grub lands. Any prairie corn lands, in a favorable season, produce good sorghum.

Hemp has not been cultivated to any extent since 1860. Previous to that time it was considered a paying crop. Since labor has become scarce and dear, hemp has been entirely neglected and only cultivated by a very few for domestic purposes only.

Flax is cultivated for the lint principally, and is manufactured for family use. Like hemp, it grows well on all our prairie soil.

Cotton is not adapted to our climate. Have seen some fair samples. Some farmers of southern nativity cultivate a little patch yearly for their own household purposes. Not a paying crop for market.

From the time this section of country was first settled, sheep have been healthy and done extra well. The first introduction of the finer grades of sheep was in the spring of 1864, by Mr. J. H. Drake and Mr. Cary McHunt—in all about nine hundred. Since that time, up to December, 1866, not less than eight thousand fine sheep have been introduced into this county from the states east of Missouri. Sheep brought into this section from the eastern states are, as a general thing, in bad condition, owing, probably, to the fact that the summer season is selected to transport and drive them. The extreme hot weather, the dust, hard roads, and large flocks huddled together in cars, without food or water, all have a tendency to destroy or injure the health and condition of the flock—arriving too late in the season to regain their usual flesh. When winter sets in, a proportion of them are in low condition and not inured to the climate, and a small loss is inevitable. After the first winter sheep in every instance have done extra well, far surpassing the expectation of our most practical herdsmen. However, one fact is worthy of note, and may not be out of place at this time—that is, that all the increase from fine wool sheep produces a larger amount of wool than their progenitors, and of a coarser quality. This view appears to be gaining ground with most of our wool growers.

The cattle raised by our farmers are mostly the common stock, which is believed to be the most profitable for milking purposes, notwithstanding a large number of grade Durhams are raised particularly for beef or market. For the last six years the larger proportion of our two and three year old steers has been purchased by men from Illinois, and there fatted for market. Our working oxen have found a good western market for crossing the plains to Idaho and other mining districts. The small amount of steers remaining, are fatted and find their way to St. Louis.

Hogs have been purchased in large number and shipped to Illinois, and there fed for market, notwithstanding a very large number of fat hogs are transported to St. Louis. The hogs slaughtered here for the last few years have found their way to the western mines in the form of bacon.

Little attention has been paid to rearing horses, beyond occassionally a farmer will raise a few for his own use. It is believed that mules are more profitable to raise than horses, on the principle that mules come into market one year sooner than horses, command a larger price, and are better adapted to our western markets, to wit: California, Oregon, Idaho, Montana, Pike's Peak, etc.

Hay and tame grasses are found on every improved farm in this county. Where the native grasses are eaten off and trodden down by stock, blue grass naturally takes its place, produces

abundantly and a fine quality. This grass is identical with and is the same as that raised in the blue grass regions of Kentucky, which is, beyond cavil, the best winter pasture in America.

Timothy grows on all our soils; stands the winter without injury; produces on an average about one and a half tons to the acre, and is the favorite hay of our county.

Red clover sown on our new, rich prairie soil, in most cases freezes out the first winter. On many farms that have been cultivated for some years, the meadows being in a locality protected or in the vicinity of timber, some fair crops of clover hay have been raised, yet it is considered a doubtful crop. White clover is finding its way on many farms and grows well.

Hungarian grass is cultivated extensively by many farmers; produces about two tons per acre, and is particularly adapted to our black prairie soil.

Millet is also a paying crop; raised to some extent; makes a good hay, and yields about the same as the Hungarian.

The Osage orange is seen growing on a great many farms, and in all instances where properly managed makes a cheap as well as a valuable fence. It is hardy and stands the winter without injury.

The soil on the rolling prairies is a dark or black, sandy loam, and in the northern portion of the county, resting on a clay bed on the south and west of Grand river, the greater portion has a limestone bed, the soil varying from two to six feet deep.

About three-fourths of this county is prairie and the balance covered with timber—mostly situated along and adjoining the numerous streams that are so liberally distributed throughout this county.

In the western portion of this county and in the forks of Grand river, the country is more rolling, with a dark, rich, sandy loam, resting on a limestone rock, making this section particularly adapted to wheat as well as other grain, and universally produces good fruit. South of Grand river, known as the Blue mounds, the prairies are rolling and rest mostly on a lime bed.

Grand river, at its junction, three miles west of Chillicothe, is two hundred feet wide, with a current of three miles per hour; at a medium stage of water, an average depth of ten feet. The east and west forks above their junction are more rapid, with higher banks, making these streams more particularly adapted to water power than the main river. In many places in the bluffs along the river you find inexhaustible quantities of fine building stone, available for all practical purposes. The eastern portion of the county is watered by Medicine river. Grand river, as well as Medicine river, takes its rise in the state of Iowa. Medicine is a deep, sluggish stream, about eighty feet wide, with a current of about two and a half miles per hour, with a sufficient amount of water for manufacturing purposes about one-half of the year, and empties into Grand river seven miles below Chillicothe. In the norther portion of this county there are a large number of smaller streams, with a belt of timber bordering each stream the entire length.

The climate is mild, being in the thirty-ninth parallel of latitude. There are few swamps, wet lands, or marshes to affect the health of the inhabitants. The air is dry and bracing. It leaves no depressing influence on the system, which is so severely felt in all the low and marshy country in more southern localities. It has an elevated surface, dry atmosphere, fine breeze, and no miasma floating in the atmosphere. These are some of the prime considerations which give such universal wealth to the inhabitants of this country.

The winters are short and mostly pleasant, frequently not snow enough to cover the ground. Outdoor work can be done without much inconvenience to the laborer. There is frequently cold, stormy weather, and severe sudden changes, but not so cold as further east and north. Winter sets in usually about Christmas and continues until about the first of March. Usually, about that time, the rainy season sets in for a few weeks, and then we usually have warm weather.

The heat in summer is not oppressive, owing, perhaps, to the dryness of the atmosphere and the cool, refreshing breeze; therefore, labor can be done with but little inconvenience. The summer winds from the boundless prairies of the west supply northern Missouri with a uniform refreshing breeze, which makes the summer uniformly pleasant, and sustains the laborer to go through the summer very comfortably. The large amount of timber which skirts the numerous streams destroys the fierce and piercing winds of winter, which the large and open prairies of Iowa and Illinois are subject to in all the winter months.

Springs of pure water are found in the western and southern part of this county, in many places. They are less frequent in the northern portion. The water of this vicinity in the streams is mostly soft, and washes without breaking.

The timber of Livingston county, found on the border of Grand river, is mostly large and fine. The same variety of timber which grows on all alluvial bottoms in the western country abounds here, and is found in perfection. Among these may be named the black walnut, cottonwood, sycamore, sugar and soft maple, black cherry, black and shellbark hickory, honey locust, white and

blue ash, hackberry, linn or basswood, bur oak, etc. On the bluffs and on the higher lands the character of the timber changes as the soil does. On the higher lands you will universally find the timber to consist of white, yellow and red oak, slippery and white elm, mulberry and hickory. Further from the streams, and on the ridges where the soil has probably been severely washed for ages, and bordering on the prairies, there frequently is found a scrub growth of timber, mostly of yellow and white oak, hickory, elm and cherry, with a heavy undergrowth of hazle, sumach, white thorn, crab apple and plum. The wild frost grape abounds in almost every locality; blackberries are found in large quantities in some localities; strawberries are found in a wild state on most of our prairies. The native strawberry, blackberry, plum, crab apple and grape all find a place in our market.

Since the slaves of Missouri have been freed and the large eastern emigration to this section labor has become scarce and dear. Wages through the season for farm work have averaged about twenty-six dollars per month, and scarce at that; mechanics command three dollars and fifty cents per day.

The free slaves are supporting themselves and doing much better than was anticipated. One thing is certain, and that is they will be able to take care of themselves. Many of them own freeholds and have erected comfortable residences. The larger portion of their children are attending school.

CHILLICOTHE, Mo., December 28, 1866.

Dr. L. D. Morse:

SIR: Your circular of December is before me. The spring of 1866 was early and warm, with a sufficient amount of rain for spring crops. About the middle of July we were visited with two or three very severe thunderstorms, lasting two weeks. Our plowed lands were flooded. Since that time little rain has fallen, and our corn crop has suffered severely; not more than three-fourths of an average crop has been gathered. Wheat, oats, rye and hay is a full average crop; buckwheat one-fourth of a crop and light. The apple crop, as well as the pears, was excellent—more than an average; peaches almost a total failure. Grapes have not been cultivated to any extent. Those brought in market this season were from the Stewart farm, and were large and fine, and had no appearance of mildew or rot. Probably not less than fifty acres of grapes have been planted in the vicinity of Chillicothe this season, principally by men of foreign nativity. The potato crop is light and of small size, owing to our extreme hot, dry summer and fall. The first snow of the season came the week before Christmas, and was about six inches in depth, and melted off in a few days. The weather is now cool and pleasant.

Yours, truly,

J. H. DRAKE.

MARION COUNTY.

CEDAR GROVE, NEAR HANNIBAL, Mo., December 31, 1866.

Dr. L. D. Morse:

SIR: In answer to your statistical circular of December last, I can say that I did not note the thermometer every day or measure the amount of rain; therefore my answers will only be of a general character.

The spring season was favorable for putting our crops in the ground in good season. I sowed twenty bushels of oats on the 22d of March. The ground froze hard afterward. I made a fair crop. The general crop was considerably above an average. The wheat crop was not over two-thirds of a crop, if that; many farmers lost their seed. I began planting corn on 28th April and finished May 18th, which was about an average of the county. The average temperature of the spring and summer was below an average in regard to heat. The amount of rain up to August was about an average; we had one or two heavy washing rains in certain localities. The month of September was unusually wet, which prevented as large a breadth of wheat being sowed as otherwise would have been.

The fruit crop was almost a failure. A few apple orchards, in choice locations, produce from one-third to one-half a crop. Some specimens were very fine, but the bulk of the crop was of inferior quality. There are only a few dozen peach trees in the county, and but a moderate crop of pears, of moderate quality; the amount being below an average.

The grape crop was greatly below an average. There are, in the vicinity of Hannibal, between ten and fifteen acres of bearing grapes, with a much larger amount of late planting, and the business is considered a paying one. The cultivation of fruit of all kinds is largely on the increase.

The corn crop of Marion and Ralls counties is above an average. Perhaps the present is the best crop of corn that we ever raised.

The hay crop is nearly double the average. The potato crop was a comparative failure; many growers lost their seed. Some fair crops were raised, under very unfavorable circumstances.

The Houghton seedling gooseberry bore a fine crop, which they do every year; the worms partially destroyed the crop last year. Strawberries did very well; Wilson's Albany has the preference. We are trying new varieties, but have found nothing as yet equal to the Wilson. Currants, raspberries and blackberries are not extensively cultivated for market.

The number of apple trees set last spring was at least one hundred per cent. above former years, and I anticipate ten-fold increase next year over this in apples and peaches, which are no longer considered an experiment.

We expect Hannibal to be the best fruit market on the Mississippi river, within the next five or six years. This statement may be startling to some, but will be realized, nevertheless.

O. H. P. LEAR.

Dr. L. D. Morse:

SIR: Your inquiry as to the products of our county, etc., was duly received. In reply I would say I have not been able to give it the attention which I should like to have done, to make this report more complete and full, so as to do ample justice to old Marion county. The soil is well diversified between timber and prairie. The whole surface of the county might be said to be rolling (with the exception of the Marion City bottom), and near the river and water courses, breaking into bluffs. The prairies have a deep, rich, black soil, with clay subsoil. The timber, of which there is quite a variety, might be classed in two classes: first, the "elm lands," with a dark, deep, rich soil, producing the largest crops of hemp; second, the "white oak lands," with a thin, light, colored soil, producing the finest fruit and grapes.

The Mississippi flows past its eastern boundary; North river and South river flow in a southeasterly direction, and empty into the Mississippi, between Quincy, Illinois, and Hannibal, Missouri. Bear creek runs nearly east, and empties into the Mississippi at Hannibal; besides these there is a number of pretty creeks and spring brooks all over the county, giving accessible stock of water in the dryest seasons.

Water for family use is mostly procured from springs and cisterns. Very few wells are in use. Where they have been tried there is a plenty of good water reached generally at from twenty to thirty feet from the surface; in some places it is reached in ten feet.

The central part of this county is called, by some, the garden spot of Missouri; and well it may be, for it is as rich as those spots are supposed to be, with a gently rolling surface; thus drawing off the surface water, and making them healthy and easily tilled.

There is no government land in the county. Prices of improved farms range from twenty to one hundred dollars per acre, according to location and improvements. Wild lands, suitable for agricultural purposes, range in price from ten to twenty dollars per acre. The land is mostly owned by actual settlers; one piece of timber is held by the Hannibal and St. Joseph railroad company.

The most abundant timber is white oak, black oak, red oak and hickory, with plenty of black and white walnut, white and red elm, white and blue ash, hard and soft maple, black and honey locust, bur oak, linn, hackberry, cottonwood, sycamore, mulberry, wild cherry, pecan, coffee nut, persimmon, dogwood, buckeye, willow, serviceberry, sassafras and birch.

Of native fruits we have crab apple, wild plum and cherry, persimmons, mulberry, serviceberry, yellow and red thorn apples, black haws, blackberry, dewberry, gooseberry and strawberry.

Of vines and shrubs we have what is called summer grapes and fall grapes, bitter-sweet (or staffiree), redbud (or Judas tree), greenbrier, ivy, running oak, trumpet vine, wild honeysuckle, yellowparilla (called by some sarsaparilla), whahoo or Indian arrow (this resembles the strawberry tree of the nurseries), hazelnut, prickly ash and black hazel.

This county is amply timbered, and the timber is well dispersed over the county, so as to be commodious to the prairie farms. We have an ample supply of lime rock, sandstone, flint rock and soapstone; no coal or ore has been found in sufficient quantity to pay to work. There has been a species of mineral paint found near Hannibal, but whether it will pay to work remains to be tested.

There are five flouring mills in the county, located as follows: two at Hannibal, two at Palmyra and one on the Bay. There are to be two more large mills opened in Hannibal this winter—all steam power but the Bay mill; it runs by water part of the season—steam the balance. We have three steam saw mills, one near Hannibal, one on the river, one on the Bay, and one in Palmyra.

We have three foundries in the county; one (brass foundry) does mostly railroad work; one iron foundry, at Hannibal, and one iron foundry at Palmyra.

We have one woolen factory at Hannibal, owned by Wolnier & Co., started in July, 1865. They have worked up about 12,000 pounds of wool, as follows: 4,000 pounds of rolls for customers, about 3,000 yards of cloth for farmers on shares, 4,800 pounds of wool on their own account, into cloth and stocking yarn. They are running two double looms, two hundred and forty spindles, one set of custom cards, and one set of factory cards. They have the best machinery that could be procured; cost about sixteen thousand dollars. They are calculating to make an addition to their present machinery, in the spring, of two hundred spindles, and other machinery to correspond.

There is a great variety of farm implements in use here. Their success not unfrequently depends upon the mechanical genius and energy of the party using them. There are several wagon shops in the county, two of them are in Hannibal, two six miles northwest, on the Palmyra road, two in Palmyra, one two miles west of Hannibal, on the Paris road. This shop gives the best general satisfaction among the farmers. It is owned by Henry Kahl.

Breaking and turning plows are made in the county. Streeter & Quailey are making a sulky corn plow at Hannibal, but I can't tell what patent.

There are about twenty-five thousand inhabitants in the county.

Wheat is grown to quite an extent; an average among the best farmers is about twenty-five bushels per acre; average of the county not over fifteen bushels per acre; fall wheat is principally grown here; the drill has been tried with good results, and is growing in favor.

The average yield of corn among the best farmers is about seventy bushels; average of county about forty bushels per acre. There is a sprinkling of nearly every known variety of corn grown here. It is generally fed in the ear. For feeding in this way the yellow dent is counted best; for grinding the white dent is preferred. Corn in marketed mostly in hogs and cattle.

But little rye is raised in the county; I believe it generally does well when sown.

Of oats, the average among the best farmers is about fifty-five bushels; for the county, about forty bushels per acre the past season; but they don't always yield as well. They are rather uncertain, unless sown very early. Barley is but little raised. Buckwheat is a very uncertain crop here.

Sweet potatoes do finely, yielding from one hundred and fifty to two hundred bushels per acre.

Irish potatoes yield moderate—about eighty bushels being a fair average. The peachblow yields the best of the good eatable potatoes. The potato bug bids fair to destroy this crop entirely; the one that worked on the potato the past year was a roundish striped bug, red upon the underside; It lays its yellow eggs in patches on the underside of the potato leaf, from which are hatched light red grubs; they eat ravenously for a few days, and then change to a perfect bug.

It is difficult to arrive at an average yield of sorghum, although there is a good breadth planted. Much of it is indifferently grown, and more indifferently worked up. The yield ranges from fifty to one hundred and fifty gallons per acre. I have worked considerable the past four years. I used the first Cook evaporator and Power's patent self-adjustable crusher that was introduced in these parts; and I think them the best in use, although nearly every patent is represented here now.

Hemp is cultivated largely; average yield among the best farmers, fifteen hundred pounds per acre; average for the county, about one thousand pounds per acre.

Flax is but little grown; too much trouble to gather it. I think if it were sown thick, ground rolled smooth, and cut with a reaper, it could be made to pay.

Cotton is grown only in gardens. I don't think it would pay for extending.

Tobacco is grown quite extensively. A fair average is about one thousand pounds per acre. There are nine tobacco factories in Hannibal, giving employment to a great many hands. The

amount of tobacco inspected the past year (1866) was about 1,500,000 pounds. We have five cigar factories in the county, viz: three in Hannibal and two in Palmyra. Their products are mostly consumed in the county.

We have two breweries in Hannibal, but they are unable to supply the home demand for lager.

There are seven brick-kilns regularly in the business, and all doing well. One of them has a a patent mold, owned by Loomis & Ward, at Hannibal. It makes fine brick.

Of lime-kilns we have quite a number; and one perpetual kiln, located at Hannibal. A large quantity of lime is shipped here annually.

We had one agricultural society in fine running order before the war. I attended one of their fairs in 1860; it was a very creditable show, the exhibition being very fine indeed. But, in 1861, the grounds were taken for a camping ground by the 3d Mo. Vol. Cav., Col. J. M. Glover commanding. The grounds were afterward sold, and the society is numbered among the things of the past. We have a horticultural society; first fully organized, January, 1864, by electing W. L. Youse, president, and S. F. Taft, secretary—they are the present incumbents. Those most active in organizing it were John Fry, O. H. P. Lear, W. L. Youse, John P. B. Foreman, J. N. Payton and S. F. Taft. We have had no fairs or exhibitions; it has been used more as a means of mutual instruction to its members than an exhibition for outsiders.

There has been considerable attention paid to sheep husbandry in this county; and there have been many improved flocks introduced here, among which you can notice the Spanish and French merino, with their fine, dark, heavy coats; the larger Southdown, with white fleece, and small head and upright carriage; the Bakewell, with large frame, long coarse wool and smutty face; Cotswold, with straight, well rounded, heavy carcase, high carriage of head and long white wool. These have all been introduced here, and tried both as pure flocks and by crossing with the native; but the sheep farmer's greatest scourge, the dogs, are so bad that many are nearly discouraged. This county seems to be well adapted to sheep husbandry, and experiments have been satisfactory, so long as they had sheep left to experiment with. We all like dogs; but I think it would be well to make every one pay for all of the sheep his dog kills, and then we would be more cautious how we keep worthless curs.

Blue grass, white clover and redtop are grown for pasturage. The blue grass pastures of some parts of the county are said to equal the far-famed ones of Kentucky. Timothy and red clover are grown extensively for hay; they yield from one to two tons per acre. Hungarian is grown to some extent, but is not prized as high as timothy or clover for stock, the idea being prevalent that it injures stock.

The Osage orange has been planted to quite an extent, and has been universally successful where trimmed and cultivated the first three years, although we see, in riding through the county, many rows of brush which will hardly stop a hog, to say nothing of pigs. Yet there are very many beautiful strings of living fence stretching for miles in succession, through which rabbits and quails have to hunt a place to pass.

The slaughtering of hogs forms quite a trade in the county. Hannibal cut about nine thousand and Palmyra seven hundred head. There are a great many taken to Quincy, Illinois, and St. Louis, Mo., on foot. How many are fed in this county I can't say, as Ralls and Monroe counties drive a great many here, and the railroad brings them from further west.

There are no regular cattle slaughter-houses in the county, although a great many are driven from here annually, mostly to St. Louis; some to Chicago and further east. There are many fine herds of Devonshire and Durham; andthey are being disseminated, so that they show more or less upon every farm. There is no dairy of any consequence in the county.

There is a great deal of pains taken in this county to improve the horse stock. We have the Morgan, Blackhawk and old Postilion (called by some the Vermont Morgan,) with many others of less note. The appearance of our teams has been very much reduced in the past five years, the best having been sold or stolen and taken away.

Mules are raised to quite on extent; their sale forms quite a trade. But I have no statistics by which I can give the number of either horses or mules raised or sold.

In regard to the raising of fruit, I would say that, in a condensed report like this, justice can not be done a subject which is of such great and growing importance to the people of this state, and more especially to this part of the state, where the apple, peach and grape are grown in such perfection. What would be accomplished in the great nursery emporium of the United States (western New York) if she had such a climate and soil as we have for the pursuit of this class of husbandry? Nearly every farm in the county has fruit upon it, and very many farmers are turning their attention to fruit growing and making it the leading branch of farming; among whom I can name O. H. P. Lear, Jasper Turner, Ballard & Youse, J. N. Peyton, Hiram Westfall, and many others, who have embarked largely in the business the past two years. I will give a few hints as to what is

considered here the best plan for planting an orchard. First: Soil, a moderately rich clay loam, with some sand. Location: a high, rolling situation; in this we secure natural drainage and a protection from late frosts—the frost will settle into the valley below. Preparation of soil: The soil should be worked deep; running one plow in the furrow behind another is adopted by many with very good results, stirring the soil from twelve to fifteen inches deep, actual measurement. This should be done in the fall or early spring, so as to allow the subsoil thrown up to freeze. Where this can be done, before planting, you can "strike out a land" of four to six furrows; plow these as deeply as possible, running the plow as deep as possible in the dead furrow; then plant with the spade in this furrow, filling in with top soil to the proper depth; then set your tree and fill around it, pressing the dirt firmly with the foot. When the row is set take one horse and plow, or an ox team, and turn two furrows toward the trees, thus filling up the dead furrows and making it a ridge; the balance of the ground can be plowed at pleasure. Where parties are planting largely this is probably the most economical way of planting. I have planted in this way by the thousand, and have lost but a few trees; others here have tried it with equally good results.

In the selection of apple trees, two or three year old, thrifty trees are the best, with tops starting within three feet of the ground; never over four feet. In the selection of varieties suit yourself, but among those most profitable will be found the winesap, Raul's janet, white bellflower or early pippin, little red romanite, maiden's blush, rambo, early harvest, red June and golden sweet. Distance to plant, thirty feet each way.

It is absolutely necessary that the location should be high and well drained to attain any degree of success with the peach. The trees should be set at one year old from the bud, with the tops started one or two feet above the ground. Fifteen feet each way is a good distance to plant, and then keep well headed in. Both the apple and peach should be cultivated. The ground may be planted in a hoed crop, but never sown with grain. The ground should be stirred frequently the first season with a cultivator, especially in a dry time.

Dwarf pears are grown to some extent here, but they need a very rich, deep mold, and kept well cultivated. Where treated in this manner we have some very fine results. Standards need a deep, though not very rich, soil, with a porous, gravelly subsoil. On such soils they do well, and as far as my observation extends they are free from the blight.

Experiments with the finer varieties of cherries have not been satisfactory. The rapid and late growth unfit them to stand the winter. Very few trees ever stand until they come into bearing. The hardier varieties, among which are the early Richmond and May duke, do very well, and bear crops annually.

Plum trees do fine, but the curculio takes the fruit. The Chickasaw is the only cultivated plum that yields a fair crop.

A great many varieties of currants are in cultivation, and all are doing well. Gooseberries have been tried, but none do well but the Houghton. Strawberries are largely in cultivation. The most profitable is the Wilson's Albany. Several varieties of the blackberry have been tried, but have all given place to the Lawton.

Vineyards are attracting a great deal of attention lately. Among the oldest growers of the grape is Hiram Westfall. He has about three acres of Catawba vines, producing very good crops annually. There was very little blight on his vines in 1865. His situation is on a high bluff, near the Mississippi river, with a southeast exposure. The soil is a yellow clay, mixed with some sand. J. N. Payton has between one and two acres, mostly Catawba. Soil and exposure about the same as Mr. Westfall's. Ballard & Youse have about one thousand vines of different varieties, among which are Catawba, Isabella, Concord, Hartford prolific, Union village, Delaware. The last named is of slow growth; Isabella mildews; the balance are doing very well. They have several other sorts not in bearing yet. Mr. Lathrop has a few vines of the Anna, Rebecca, white muscat, Delaware, Concord, Roger's hybrid—Nos. 1, 4, 9, 15, 32—Catawba and Isabella. Anna and white muscat are a little tender, but the others are doing very well. It is estimated that there are forty acres planted in vines in the county, ten acres of which will come into bearing this next season.

Very respectfully,

S. F. TAFT.

NEW MADRID COUNTY.

NEW MADRID, Mo., January 21, 1867.

Dr. L. D. Morse:

DEAR SIR: Yours of December last, propounding certain questions, is at hand, and I herewith answer for New Madrid county.

The spring of 1866 was clear, open weather, with frequent showers, and the summer dry and warm. The fall was more disagreeable than usual, and generally colder for the season.

The fruit crop was very slight; no peaches or other nutted fruit, and but few apples; trees in some localities troubled with blight; grapes but little cultivated, and appear to suffer from blight and rot, and the birds are far more destructive to them. The cultivation of fruits generally is on the increase throughout the county.

Crops, as a general thing in the county, yielded not over three-fourths of a crop. For castor beans we have the best of soils and locality. This year, the first one they were ever raised here in any quantity, not more than half a crop was made, in consequence of drought and not being planted early enough, say from the 1st to the 15th of May. The May wheat was good, but we grow but little, having no mills near us, though I have seen as fine a berry raised here as I ever saw in New York, Iowa or any northern latitude. We raise but few oats. Last year the crop was better than for the last seven, but was much injured by rust. Barley is not raised; neither is flax, tobacco or hemp, and but little rye, which does well. The grasses are most shamefully neglected. All of them do well here. Cotton yielded not over three-fourths of a crop, owing to drought and early frosts. This staple here compares favorably with the Arkansas cotton.

In the county the land is a level plane, the soil a black sandy loam of great depth, producing in abundance every variety of grains, if cultivated.

With our former slave labor we have been slow to introduce any of the labor-saving machines of the north, which are now slowly coming into use.

Almost all kinds of fruits do well here, although we have but few good orchards in the county. Fruit might be raise with profit for shipment either north or south.

We much need a county agricultural society. We failed last year in getting up one in consequence of the courthouse being in use at the appointed time of the meeting; but we are thankful to you for the valuable books furnished us, and shall try to organize this year.

Very truly, yours,

THOMAS L. FONTAINE.

OREGON COUNTY.

PINE FOREST, OREGON COUNTY, Mo., November 5, 1866.

Dr. L. D. Morse:

DEAR SIR: In response to your letter of the 18th of August, covering circular containing interrogatories in relation to agriculture, etc., I beg leave to submit to you a few remarks based upon the actual condition of Oregon county.

The ravages of a cruel civil war so depleted us of population, stock and everything else indicating the thrift of the farmer, that a report must be meager, indeed, that correctly describes the status of this county. But meager as it is, I feel it due to this county to submit it to your consideration. But when we take into consideration the fact that at the close of the war, in May, 1865, but seventeen months since, this county contained less than two hundred families, and half of them without a male head; that our villages and farms had been consumed by the torch of the jayhawking incendiary; that many of our families were living in camps; that our mills, stock and grain were all swept away, and compare our condition then with the present, and we have much, very much, to encourage us in making further efforts to regain what we have lost, and in setting examples to our older sister counties, lying contiguous to us, of industry and enterprise. We confidently hope that as a county our march is onward and upward, and at no distant day we shall be able to sit under our own grapevine and apple tree, and eat the fruits thereof in perfect peace, and look back upon the sacrifices we have made to sustain ourselves during the war, and to rebuild our destroyed farms with pride and pleasure.

The following is a general description of the county: Oregon county is a tract of country

lying between the Arkansas line on the south and township 26 on the north, and embraces ranges 2, 3, 4, 5 and 6, being 30 miles long by 26 wide. It generally has an uneven or broken surface, interspersed with beautiful valleys. The ridges in some portions have a gravelly loam, while others are clear of rock or gravel, and contain soil of excellent quality. Eleven Points river runs through this county from northwest to southeast, and is, where it crosses the line between ranges 3 and 4 west, about 150 feet wide. The current is rapid, with a rocky or gravelly bottom. It is formed of three creeks—Eleven Points, Middle fork and Barren fork—which form a junction at Thomasville and at or near the lower end of the valley called the "Richwoods of Eleven Points." In addition to those named, we have the Warm fork, Frederick, Cotton creek, Mill creek, Spring creek and Hurricane; all except Warm fork emptying into the Eleven Points river.

Of springs we may say that we have as fine and as large as can be found in this State. There is one spring, six miles east of Alton, our county seat, which affords more water than the justly celebrated spring at James' iron works in Phelps county. We have as fine water power as can be found elsewhere. The water is soft.

The northeast portion of the county is covered with fine, large pine trees, often 75 feet to the first limb. This fine forest lies contiguous to the water power above described, and contiguous to a river sufficiently large to convey upon its bosom any quantity of lumber that can be manufactured here, and presents a pressing invitation to lumbermen to come and invest. In addition to the pine, we have several varieties of oak, hickory, black and white oak, elm, gum, sugar maple, honey locust, hackberry, etc.

Of shrubs there are pawpaw, hazle, sumach, ground oak, spice, gooseberry, etc.

Of vines, in this county, we may number the grape, honeysuckle, trumpet flower, Virginia creeper, ivy, pea, and various other vines and creepers.

Of fruit growing wild in the woods, we may find the grape, plum, pawpaw, haw, crab apple, persimmon, blackberry, strawberry, etc.

There are about 100,000 acres of government lands, mostly of inferior quality. There are at least 100,000 acres owned by non-residents. None by corporations. The average price of improved lands is about five dollars per acre, and of wild or unimproved lands the average price would be about two dollars per acre.

The rocks in this county are limestone, freestone, flint, quarts, etc.

Iron, lead and copper indications are abundant. Lead has been found in several localities in the last six months, but not in sufficient quantities to pay for working.

No coal or coal oil yet discovered.

Our farmers are using such farm tools and implements as our country blacksmiths make. They are rather primitive.

An agricultural society is now in process of formation. The requisite number of freeholders has been obtained, officers elected, and we are now awaiting the action of the county court for the order of incorporation.

We have about 8,000 acres of land in cultivation, and we estimate our population at 8,000.

Of the products of the soil, corn is our staple product, of which we raise about 20,000 bushels. The common yellow and white varieties are generally raised. The white variety would get the most votes here. The average per acre is about thirty-five bushels.

Our wheat yields about fifteen bushels per acre. We use no drills; do not drain or subsoil. The estimated crop this year yields 3,000 bushels.

We raise upon an average thirty bushels of oats, and about 250 bushels of potatoes.

We raise from 800 to 1,000 pounds of cotton. New lands suit it best.

I may here be permitted to say that the sorghum has become to us an absolute necessity, the variety known as the imphee being the favorite kind. It grows well in any of our soils, but prefers a rich loam, freshly broken. No sugar yet made here. Our implements for making molasses are of the most primitive kind. We use for crushing the canes and pressing out the juice two wooden rollers, propelled by one horse. Our boilers and evaporators are our own wives' wash kettles.

We have no large flocks of sheep. What few we have, however, are enjoying the fine natural pastures on our hillsides, and have uninterrupted good health. This is decidedly a sheep country, the wolf and dog being their only enemies. We have a few French merinos among our flocks.

Our hogs are of the common "long-snouted" variety, which are to the "manor born." A very slight improvement is perceptible by a cross with the Berkshire and Byefield.

Of our cattle it may be said that we keep up our primitive breed, and adhere to them with as much tenacity as any Ohio man would to his "short horns." They are a hardy race, gentle and kind; good milkers, and perfectly independent of man, so far as living is concerned, for if their owners will not winter them they winter themselves in the woods. Of this we take due notice, and govern ourselves accordingly. We have about 4,000 head here. About 1,000 of these little animals have been driven to market this year.

I suppose that we raise about four hundred horses here annually, worth about $60 per head. There are in this county about 2,500 horses.

We raise but few mules; the average price is about $100.

I may be permitted here to mention that the events of the war depleted us of all kinds of stock. We are not yet fairly at work for the want of stock in trade. We have the natural meadows for summer range, the rich soil for winter pasturage and for the raising of grain, a very mild and salubrious climate for man and stock; we therefore propose ere long to enter the list with our older and richer sister counties for stock prizes.

Of vineyards we have none, but that we have a grape growing soil and climate there can be no doubt. We have tested here the Catawba, Clinton, Concord, Taylor, and several other varieties, that seem to flourish as if they had originated here. This ought, and I think, will be a wine producing county. We have every natural advantage we could desire for the maturing of the grape in its greatest perfection.

About the year 1860 our people began to see the necessity of planting orchards, hence thousands of trees were imported from New York, Ohio, Illinois, Arkansas and Springfield, Missouri, and planted in the fall of 1860 and the spring of 1861. But alas! war, civil war, with all its horrors, came on and crushed alike the trees and the lives of many who had planted them. Few, very few, of the many thousands then planted survived the war; but that it is a fruit growing country there can be no doubt. To prove which I may be permitted to refer to one case where trees were planted in the fall of 1860, now just six years. While others were engaged in blood-letting, the owner of that orchard was engaged in making the application of "soap-suds," and what he had learned of pomology, to his young trees, the result of which is that now, at the end of the sixth summer, his trees, planted on a poor hill, without other manure than a little "suds," now measure over six inches in diameter, and have produced as fine fruit as ever grew in this part of the state, or perhaps elsewhere.

We have some immigration here, and expect a heavy influx this fall.

Field hands command from fifteen to twenty-five dollars per month.

We have but few freedmen here; cannot see much difference now and when they were slaves. They were an expense to their masters then; don't think they are much better now. I refer, of course, to this part of the state.

J. R. WOODSIDE.

OSAGE COUNTY.

Dr. L. D. Morse:

DEAR SIR: Osage county is situated near the center of the state, is bounded on the north by the Missouri river, on the west by the Osage river, east partly by the Gasconade river, and on the south by Maries county; is traversed on the west by the Big and Little Maries creek, through the middle by L'Ours creek, watered on the east by Deer and Baylies' creeks.

The Gasconade river is the only stream which affords constant water power. It is well watered, besides, by innumerable springs of both hard and soft water. Surface broken or rolling.

The north part of the county is heavily timbered with every variety of oaks; the river and creek bottoms, with oaks, sycamores, hackberry, elms, black walnuts, white walnuts, sugar trees, shellbark hickory; the underbrush on the river and creek bottoms being composed of paw-paw, spice, sassafras and hazel. Wild grape vines of several varieties also abound.

The underbrush on the uplands is composed of sassafras, dogwood, sumach, hazel, redbud, and a large variety of summer grape vines.

The south part of the county is composed of what is called barrens, and is sparsely timbered, except on the water courses; with black jack, black oak, post oak, and on the high ridges with white oak, the underbrush being principally composed of hazel, sumach and wild grape vines, and is well adapted to the raising of stock.

There is but very little government land remaining, and their character is worthless. There is a large quantity of land owned by non-residents. The average price of improved farms is about ten dollars per acre. Farms are selling at from five to forty dollars per acre, according to situation and quality. The average price of unimproved land is about five dollars per acre.

Of minerals we have limestone, cotton or freestone, and sandstone abounds; no coal mines have been opened as yet, although indications of coal exist in several localities. Iron and lead ores exist in this county in almost any quantity, lead ore being found in almost every flinty knob in the south part of the county. Several of the mines were being opened before the civil war broke out, and have laid dormant ever since. There exist strong indications of coal oil in different parts of the county, and boring experiments were being tried this season, but I do not know with what success.

There are nine or ten steam flouring mills, besides two or three water mills, in this county.

Reapers and mowers and threshing machines are coming into use very fast in this county, the most of our best farmers having them now.

There is no agricultural implement manufactories in this county, with the exception or plows, which are manufactured by our blacksmiths.

We had an agricultural society in 1860, under the name of the Osage county agricultural and mechanical association, but the war broke it up. There is about one-tenth of the county under cultivation.

Our principal productions are: Wheat, the average yield of which is about fifteen bushels per acre. Some good farmers raise as high as thirty or thirty-five bushels per acre. Fall wheat is altogether cultivated. Subsoil plowing has not been tried yet, but deep plowing is practiced by every good farmer. Underdraining has not been tried yet, and it is not thought necessary in a country rolling enough to drain itself.

The average yield of corn per acre of a good season is about forty bushels; there are two varieties cultivated, the white and the yellow; some farmer consider the yellow best for stock. It is generally fed in the ear.

Rye is cultivated but little, and that mostly for winter pasturage. Oats are cultivated extensively, and yield about thirty bushels per acre. Barley is extensively cultivated, and averages thirty-five bushels per acre. Buckwheat is cultivated principally by the Germans for home consumption, and does well in suitable seasons.

Potatoes are pretty extensively cultivated, and of good seasons will yield two hundred bushels per acre.

Sorghum is cultivated by nearly every farmer for his own use; there are two varieties cultivated, the black seeded and the red. Some persons prefer one variety and some the other. Bottom land yields the tallest and largest canes, but good upland will yield the sweetest canes. No sugar has yet been manufactured from it in this county. It is ground on wooden rollers, but cast-iron rollers are coming into use, wooden rollers being mere make-shifts.

Hemp is not cultivated except for home use, although a good deal of the soil of this county is well adapted to its growth.

Flax, like hemp, is only cultivated for home consumption.

Cotton has been grown to some extent in this county since the war; succeeds best on upland, and yields about one hundred pounds of fibre per acre.

Tobacco is grown to a great extent for market; average yield one thousand pounds per acre, of the large kind, suitable for manufacturing purposes, and from six to seven hundred of the lighter kinds. The crop does not seem to be particularly impoverishing to the soil, unless it is cultivated three or four successive seasons on the same land; the best crop of wheat being generally made on land on which two successive crops of tobacco have been raised.

No wool is produced for export in this county. Our flocks consist principally of the common breed; the largest flocks containing from sixty to one hundred head. This county is well adapted to the raising of sheep. They are very healthy, and, unless in the barrens or prairie part of the county, the wool never deteriorates or becomes coarser on the fine wooled breeds. Dogs are the greatest enemy to sheep in this county. But for them sheep could be raised in any quantity; they requiring but very little care at the hand of the farmer. They get very fat on the pasturage afforded by the country, and three months' feeding would take them safe through the winter. The mutton is of good quality and fine flavor.

Hay and tame grasses are coming into favor with every good farmer. Timothy and redtop are cultivated for hay, and are well adapted to our northern hillsides. White and red clover and blue grass make the best of pastures, and clayey lands, worn out by bad management and long culture, are renovated by the cultivation of red clover, timothy and redtop, will yield from one to three tons per acre.

Hedges have not been tried to any extent in this county.

Several hundred hogs are driven to market from this county every year; the average weight is about two hundred pounds. There have been several kinds of improved breeds introduced in this county, of which the Chester white is preferred, as they seem to do better than any other variety.

A great many cattle are driven to market from this county every year. The Durham, as well as a few of the other improved breeds, have been introduced. There is no one breeding especially for the dairy. We have no dairies in this county.

I judge there is no less than a thousand horses and mules raised annually in this county for market; the average price of horses, one hundred dollars; of mules, one hundred and twenty-five dollars; draught and saddle horses are mostly raised.

Orchards are coming into general favor with the farmers of this county, and thousands of fruit trees are planted every year. This county has proved itself so well adapted to the raising of fruit, and the profits of fruit growing are so large, that every good farmer is bent on planting orchards commensurate with the demand. Apple trees thrive and grows apace on our steep hillsides, and produce fruit of the best quality.

The vineyards in this county are not very extensive as yet, although the culture of the grape has been practiced by many for the last fifteen years; but owing to mismanagement on the part of some, and mostly owing to the kinds cultivated by all, have proven almost an entire failure. The kinds first cultivated were the Isabella and a small black grape called by some the Burgundy, and by others petit noir. The Isabella proved itself worthless for wine purposes, and the other not much better. Then came the Catawba, a very thrifty vine, and a good bearer, but subject to the rot or mildew, except on high and dry places, or on land which seemed entirely worn out, and then it could not be regarded as a sure crop; yielding on an average about three hundred gallons per acre. Then came the Virginia seedling, which proved a very hardy vine, a good bearer and an almost entire stranger to rot or mildew, making a very fine quality of claret wine. It has not been cultivated extensively enough in this county as yet to enable me to state with correctness what will be the average yield per acre. The Concord grape made its appearance about the same time, and has proved itself a good bearer, and as hardy a vine as the Virginia seedling, and as free from mildew or rot, promising to yield about one-third more per acre, and to make a very good quality of wine. The Clinton has been tried also, and so far has given entire satisfaction.

About one-tent part of Osage county is well adapted to the cultivation of the grape vine, being composed of river bluffs, high lands and hillsides, where any desired exposure can be obtained; the soil rich in all the elements suitable to the grape, with a clay subsoil noways retentive of water. Osage county offers to the vintner advantages that cannot be surpassed by any other county in the state. Surrounded on three sides by navigable streams, the Pacific railroad running through it from east to west, makes it very easy of access; and, in my opinion, the day is not far distant when it will rival Gasconade county in the production of the grape.

All of which is respectfully submitted.

LUCIEN PHILBERT.

BONNOT'S MILL, OSAGE COUNTY, MO., December 28, 1866.

Dr.-L. D. Morse:

DEAR SIR: In answer to your circular, I will state that I have no particular data to refer to for my answers, but will make them according to the best of my recollection.

The early part of last spring was very wet, the later part very dry. We had several thunder storms, accompanied by heavy rains, in July and August, and a great deal of rain in the beginning of September. The autumnal months were fair, with the exception of one or two heavy rains.

The fruit crop was fair in character, but not more than half a crop of winter fruit. Summer fruit was an almost total failure. In some localities the peach crop was very fair and of good quality; the same with pears. The grape crop was very good in some localities, and in others they suffered a great deal from the blight or rot. Catawbas, cultivated in high localities, with a south or southeastern exposure, suffered but very little. Norton's Virginia seedling, Concord and Clinton, and several other varieties, did not suffer from the blight or rot at all. The cultivation of grapes is increasing very fast.

Corn, this year, generally speaking, did not average more than half a crop. Wheat yielded a very fair average crop and of good quality. The same of oats and barley; while hay yielded something better than an average crop.

Yours respectfully,

LUCIEN PHILBERT.

PERRY COUNTY.

Dr. L. D. Morse:

In answer to your circular, I would say that we have had a rather wet spring. The early part of the summer was dry, and during the latter part of summer and autumn we had plenty of rain.

We had a large crop of fruit. Grapes are not cultivated to any great extent in this region. They did not suffer from the blight or rot. The cultivation of fruit is increasing very rapidly.

This year's crop of hay was full. We had a better quality of wheat than last year. Of corn, oats and barley we had more than an average crop.

Perry county is peculiarly adapted to fruit raising, the crops hardly ever failing; and our wheat is of the finest quality.

CHRIS. A. WELEN,
Clerk Perry County Court.

PHELPS COUNTY.

ROLLA, December 29, 1866.

Dr. L. D. Morse:

DEAR SIR: I am in receipt of your circular of the present month, asking for information, which I proceed to answer, according to the best of my knowledge, as follows:

The spring of 1866 was very wet, and the summer very dry—almost a drought. Early autumn unusually wet, and late autumn clear, pleasant and mild; no heavy frosts till November. Some hard showers, but no terrific thunder storms.

There was a remarkably full crop of seedling peaches, and a fair crop of budded fruit; but some sorts of the finest peaches were a total failure, the fruit buds having been killed last winter with the cold and sleet. There was a fair apple crop, but somewhat injured with the cold, wet weather in early May. Many trees that were in full bloom at that time had no fruit at all, while those that blossomed earlier and later were overloaded with fruit. Especially the winesap and golden russet suffered much from dry rot on the trees before they were ripe; as also Tolman's sweeting and fall pippin.

Pears are not much in bearing here yet, the trees being too young, but look well. Some, during the drought of summer, showed signs of blight, but revived when the rains came. The cultivation of fruit since the war is greatly on the increase.

A great number of grapes have been set within the last few years, and those that came into bearing the present season were remarkably prolific and entirely free from blight or rot.

Corn, wheat, oats, barley and hay were all a full average crop; but corn was somewhat injured with the dry weather. Wheat was remarkably good. Oats and barley are not much sown, but did well where well put in. Hay was a full crop.

Taking everything into account, I am free to say that the crops in this vicinity show a great increase, both in quantity and quality, over those of last year, and the improvements going on denote a general thrift with the people. Much more breadth of land has been sowed in wheat this fall in this county than was ever put in before, and thus far it looks remarkably well. Roots and vegetables were also good crops.

E. W. BISHOP.

PLATTE COUNTY.

WESTON, PLATTE COUNTY, MO.

Dr. L. D. Morse:

DEAR SIR: In answer to the interrogatories in the circular of the Missouri state board of agriculture, the following, though deficient, contains all the information I have been able to collect:

The surface of Platte county is rolling, rich and well adapted to the growing of crops common to the northwestern states. This county is bounded west by the Missouri river, the width of which is about one thousand yards, and flows with a force of current amounting, perhaps, to four miles per hour. Platte river flows through this county from north to south, with a width of one hundred yards, and a force of current not less than three miles per hour. It is a good stream for manufacturing purposes, and has now upon its banks several fine mills in full operation.

The principal varieties of timber are the oak, walnut, hickory, ash, elm, honey locust, hackberry and cottonwood.

Wild fruit trees are not numerous. The crab and plum once grew here in large numbers. Grape vines were large and hung upon almost every tree in the forest. The gooseberry bush, once very common, is now found only in few localities.

But little if any government land is in the county. With but few exceptions the land is owned by resident citizens. The Leavenworth city company own a few hundred acres adjoining the ferry landing.

Much limestone is found in most parts of the county, of excellent quality, and to some extent is used in building and fencing. But little coal as yet has been discovered. Some two or three leads are known, lying near the surface, of six or eight inches depth. Our county furnishes no coal oil; nor do we know of any indications of coal oil, nor of any efforts that have been made to find any.

We have about fifteen flouring and near the same number of sawmills in our county. Arrangement has been made to erect a large woolen factory very shortly in the city of Weston.

Our implements are of the latest improved order. But few, however, are constructed in our county, if the plows and other smaller implements manufactured in Weston and Platte City are excepted.

We have but one agricultural society, which for several years has done much for the county by encouraging and stimulating our farmers to improve their stock of horses, mules, cattle, hogs and sheep. And we still anticipate greater improvement, if this society adheres faithfully to its original purposes. The society, at its last exhibition, distributed first-class premiums to the amount of three thousand dollars.

As near as can be ascertained, at least half of the inclosed land in our county is used for growing our crops. Much of the land used for pasturage does not as yet grow much grass, and especially the blue grass, though possessing all the qualities necessary to produce it in great abundance.

The white population amounts, in this county, to about fifteen thousand white; the black does not exceed four hundred—some of these are engaged in farming, generally for the owners of the soil, by which they gain a scanty living, while the greater number go to the towns and cities and enjoy rather an indescribable condition of life.

Our soil yields, per acre, some eighteen or twenty bushels of wheat; forty of corn; thirty of oats; forty of rye; barley, forty; buckwheat, thirty; potatoes, eighty. The soil will grow, per acre, some eight hundred pounds of tobacco of a coarse quality, and about the same amount of hemp, though but little of either is now raised. Sorghum is cultivated in small quantities, principally for home consumption. But little flax or cotton is raised. Our hay is made of timothy, red clover, redtop and Hungarian. The first three yield an average of twelve hundred (?) per acre, while the fourth often doubles in tons the number of acres sown.

Each family generally has a family flock of sheep, the wool being of the common class—that is, of the Esaw kind. This is the common sheep in the county; but there are some farmers raising Cotswold, Southdown, French merino and Bakewell. Growing wool, so far as tried here, has paid well, our climates and soil being well adapted to this business.

We slaughter for home consumption twenty-five thousand head of hogs, and perhaps as many are raised for other markets. The Chester white is regarded as the best hog in this county. The average per head, so far as known, when prepared for food, is about five hundred pounds. We also have other good breeds among us.

We have nothing new in our stock of cattle. The short-horned Durham is still the favorite here. This breed suits our climate, and pays us well in milk and beef, and especially in work, for all the attention bestowed on them.

It is estimated that five thousand head of horses are annually raised here, having an average value of one hundred and fifty dollars. We raise generally for the harness and saddle. Efforts are, however, being made to introduce the roadster.

One thousand head of mules, it is supposed, are raised each year, and generally sold to the government at an average price of not less than one hundred and fifty dollars. Size has much to do, as a common occurrence, with the price—too much so for the improvement in other essential qualities. Not much attention given to the raising of jacks and jennies.

Our farmers are bestowing much attention to the raising of fruit, especially the apple. Many of them have orchards of apple trees in number from one hundred to one thousand, including the young with the old trees. These embrace the best varieties of summer, fall and winter apples. So far as known, the young tree taken from nurseries here does better than those brought from a distance, for the variety. Apple growing is becoming a permanent and profitable business here. Our apples are being carried over the plains to many distant settlements. Pears of different varieties succeed very well, but as yet have not received the attention they merit. The peach tree is of short duration and often yields no fruit. When it does come it is generally of good size and flavor; but our climate is too cold and changeable for this tender plant. Some efforts have been made to grow the best varieties of the vine, and, as far as tried, do very well. We need, however, more stimulus to raise, and a better appreciation of the value of fruits, in order to develop all the resources we could command in fruit raising. And we anticipate the day as at our doors when Mr. Coleman's agricultural paper will become more than ever a very trusty and welcome visitor. If you need a fuller detail of our fruit growing business, we refer you to Adam Durgus, of Weston, Platte county, O. C. Steele, Iatan, Platte county, or Marion Todd, Platte City, or N. P. Nelson, Weston, Platte.

In regard to our agricultural society, we will further state that, for many years, it has been regarded as one of the best above St. Louis. And with its present energetic and popular president, W. K. Faulkner, with our efficient board of directors, we anticipate a bright future for the society.

Yours, respectfully,

JAMES W. STEELE.

PUTNAM COUNTY.

UNIONVILLE, MO., January 4, 1867.

Dr. L. D. Morse:

DEAR SIR: In reply to your inquiries, I have to say that the spring in this section of the country was wet and cold; the summer, hot and dry; autumn was the most seasonable part of the year. Although the spring was unfavorable, the crops looked fine, until the dry weather set in in summer. Corn crop rather poor—about like it was last year. Wheat and oats are the best they have been for ten years.

There was a fair crop of apples raised in this section; I think they were rather small, and had a great many small, hard or rotten spots on them. But few peaches were raised in this section, and none last season. The farmers are just beginning to look to the culture of grapes. There are but few old vines, and they are doing splendidly. A great many vines were planted last season, as there were of all kinds of fruit trees. Last season was not considered a favorable season for any crop, although corn was an average; wheat and oats above the average; also a good crop of hay. I am not prepared to give any extended information on these topics, and am not qualified, if I had the means. If I had time, I would get some one to do it. If you can make any use of this information you are welcome.

Respectfully,

MILTON CANBY,

Sec. Putnam Agricultural Society.

RALLS COUNTY.

January 25, 1867.

Dr. L. D. Morse:

SIR: I will give you a report for Ralls county from such material as I have at hand, so that our county may be represented among her sister counties; for I think she cannot be surpassed as a fruit growing district, which she has scarcely commenced developing. We want more practical,

educated fruit growers, and then we can have "vine clad hills, and our hillsides and bluffs will blossom with the peach and apple."

The general character of the country might be said to be rolling, with a considerable bluff range along the Mississippi and Salt rivers. In the central and southwestern part of the county is quite a stretch of fine rolling prairie, with many fine stock farms. The soil might be classed in four general classes: First, the prairie, with a deep, rich, dark soil, with a light colored clay subsoil; second, the elm and bottom lands, with a deep, black mucky soil, which makes the finest corn land when a little subdued; third, what might be termed the highlands, timbered with black oak, hickory, linn, elm and black walnut; this has a tolerably deep, dark, rich soil, from which is produced the best crops of wheat in the county, and as fine kernel as any part of the United States; fourth, the bluffs, or white oak lands, with a thin sand loam, with mostly a porous yellow clay and sand subsoil. This is our finest fruit lands; the apples raised upon those high white oak ridges are much better flavored than those raised upon the lower lands.

The Mississippi flows past the eastern boundary. Salt river flows diagonally nearly the entire length of the county, entering near the northwest corner and emptying into the Mississippi near the southeast corner of the county. Lick creek and Indian creek empty into Salt river in the western part of the county. There are numerous other small streams and spring branches all over the county, giving a plenty of stock water to all parts of the county in the dryest seasons. Salt river cannot be called a good mill stream on account of its great rises after a rain; it is very difficult to make a dam stand, although there are two flouring mills upon it now. The water in this county is mostly hard.

With respect to timber, I would refer you to the Marion county report; timber is about the same in the two counties.

We have no government land in the county. There are two or three forties of railroad land unsold; they are well timbered, but very broken.

Improved farms range from ten to sixty dollars per acre. A pretty good stock farm can be bought at from twenty to twenty-five dollars per acre. Grain and fruit lands are higher according to the improvements. Unimproved lands are from five to twenty dollars per acre.

We have an abundance of lime rock, sandstone, soapstone and stone coal. How large a surface the coal underlays I cannot say, for it has not been worked enough to define its breadth or depth. There has been considerable coal taken out in the western part of the county, near Lick creek, where it lays near the surface. The blacksmiths are using it. Some parties haul it to Hannibal, a distance of twenty-five miles, with wagons. The blacksmiths call it good coal. It has less sulphur than some of the Macon county coal. We have excellent beds of potters' clay in the county.

We have two custom flouring mills in the county and five or six sawmills. We have no foundery or woolen factory in the county. One carding mill.

Nearly all kinds of improved farm implements are being introduced here, many of which will be retained as an acquisition; others will be thrown aside as worthless. Among the latter are some of the combined reapers and mowers; some do not work well as mowers, others are not fit for either. I will mention one of Comstock's rotary spaders, in use by Mr. Trabue: it does its work well on clean ground, but clogged on wheat stubble where there were many weeds. A. Brown manufactures plows and wagons, at New London; also, a gang turning plow, an invention of this county. I can't tell what the general verdict will be upon it, as it came out late last season and was not used much, but worked well as far as tried.

We had one agricultural society; it held several fairs before the war. The grounds are sold, and it is numbered among the things of the past. Our principal productions are wheat, corn and tobacco.

The average wheat crop, among the best farmers, is about thirty bushels per acre; average of county, not over fifteen bushels per acre. Subsoiling has been tried—some with very good results. Here is the verdict of some who have tried it on the white oak lands: "Turning the ground up twelve inches deep and letting it freeze, is as good as a coat of manure." The drill has been tried with good results, and is used considerably where the ground is free from stumps, etc. The arguments advanced in its favor, by those who have used it, is that "it places the grain in a furrow, and every rain will wash a little dirt down around the growing grain, and in winter every thaw covers the roots of the grain deeper, instead of throwing it out of the ground." Winter wheat is principally grown here. Under drainage has not been tried to any extent, if at all.

The average corn crop among the best famers is about seventy bushels per acre; average of the county, about fifty-five bushels per acre. Corn is generally fed in the ear, and for want of a better place, it is generally thrown upon the ground. The yellow dent is considered best for stock; marketed by fattening hogs and cattle.

Rye is not sown to any extent, except where mixed with wheat; then it takes possession of the field after a few times sowing, if pains are not taken to clean the rye from among the wheat.

The average oat crop among the best farmers is about fifty-five bushels per acre; average of county not over thirty-five bushels per acre. Rather uncertain crop unless sown early.

Barley is but little sown. Buckwheat is a very uncertain crop.

Sweet potatoes do well here; they yield from one to two hundred bushels per acre, according to the cultivation they receive.

Irish potatoes do only moderately well; a fair average of the county, about eighty-five bushels per acre. The white oak lands yield the best crops.

Sorghum has been cultivated to quite an extent, and nearly every named variety, with results as various as the cultivators are numerous; yield fifty to one hundred and fifty gallons per acre. Good white oak land is considered the best. No sugar has been made that I have heard of. Iron crushers of various patents are in use, with a few of Cook's evaporators; but it is mostly manufactured with wooden mills and boilers of various devices.

Hemp is cultivated to some extent; average yield among the best farmers, one thousand pounds per acre; average of the county, not over nine hundred pounds.

Flax not grown to any extent. Cotton is grown only in gardens.

Tobacco is grown quite extensively; average among the best farmers, about twelve hundred pounds per acre; average of the county, about one thousand pounds per acre.

Some large flocks of Spanish and French merino sheep were brought in from Ohio the past season; nearly every grain or stock farm has from twenty-five to two hundred sheep of various grades. There are some Bakewells, Southdowns and Cotswolds; the two latter crossed with the native is the most common. In this county mutton is not considered a healthy diet for dogs, for when a farmer finds a sheep killed by dogs, he puts poison in it and leaves it where he found it; this is a good way of getting rid of a lot of worthless curs, with now and then a good dog. Sheep are generally quite healthy.

No great attention is paid to tame grass for pasturage, in this county. Timothy and red clover are grown quite extensively for hay; yield, from one to two tons per acre. The bailing of hay for market forms quite a trade in some parts of the county. Dudley Commins, James Moore, and T. Davis, I believe, are the heaviest operators in the county—postoffice at Hannibal.

Hedges have not been tried to any extent, but where tried have given good satisfaction; at least the planting of live fences is increasing in the neighborhood where it has been tried. Osage orange is the only plant used.

I have no statistics by which I can give anything like an average of the number of hogs marketed, although the raising and fattening of hogs for market is carried on extensively in this county. I do not know of any one who carries on the raising of pure improved breeds, but you will find nearly every herd mixed with Chester white, Berkshire, large China, or Irish grasiers; average weight about two hundred pounds.

Improved breeds of cattle are being introduced into this county by several parties. The Durham and Devonshire are both here. John D. Biggs has probably as good a herd of Durhams as there is in the county. Many others have fine cattle, both pure bloods and crosses. No dairy of any importance in the county. Mr. Hawkins milks thirty cows, and sells the milk in Hannibal.

Nearly every farm has fruit upon it; some of the trees are not in bearing, some are just coming into bearing, with here and there an old orchard. Some twelve years ago Frank Richmond and a Mr. Colburn commenced planting orchards of improved fruit, on the bluff range, about four miles south of Hannibal (and if I mistake not, on graded or bit land). They very soon demonstrated the fact that they had chosen the right soil and situation to make fruit growing pay a large dividend. Since which others have embarked largely in the fruit business in this county, among whom I would name Charles Bulkley, who commenced about eight years ago, and has about 1,500 trees. He has some of the finest specimens of wine sap, jenitan, white winter pearman, Newton pippin and Ortley, and the largest specimens of Duchess d'Angoulême pears that I ever saw. His orchard is on the bluff range, about one mile from the Mississippi river. Mr. Parker and Mr. R. Floure commenced about the same time and have about the same amount out. Mr. A. T. Hastings has 200 trees, two years set, with numerous others. John P. B. Foreman I would recommend as a good man to apply to for a fruit report, for he is a great lover of practical horticulture, and is experimenting with different varieties of fruit and grapes.

We have no very extensive vineyards in the county. J. B. Brooks, of Hydersberg, has a small one of Concords and Hartford prolific; they are doing well. He sold his Hartfords in Hannibal, at 40 cents per pound, and Concords at 30 cents per pound, last season.

The writer and his brother have about forty varieties of grape, but only a few kinds grown for

experiment. Next year I will try and report progress, as a good many of them will bear this season. We have also a young nursery of fruit and grapes.

Yours, respectfully,

S. F. TAFT.

RAY COUNTY.

RICHMOND, Mo., December 31, 1866.

Dr. D. L. Morse:

DEAR SIR: Your circular of this month was received. The spring season was about an average as to cold and moisture or dryness, rains or thunder storms.

The fruit crop was very short; there was about one-fourth of an average of apples—peaches none. Grapes, a very light crop; they have never been very much cultivated here, but from experiments made thus far, I am inclined to believe that the grape could be cultivated to success. The crop last season was damaged very much, in the latter part of the season, from dry, windy weather, or too much wet in the first part of June. I do not know that I am posted as to the true cause of so short a crop, but can say that we had a very short crop of grapes. The cultivation of all fruits is on the increase.

In regard to corn, we had not quite an average crop. Our crop in the first part of the season bid fair to be the best we had raised for many years, but it was cut short by long continued dry weather in the months of June and July.

The wheat crop was very fine; we did not have a large crop sown, but the yield was good; was an average.

Oats, but a small crop sown; growth was never better—over an average.

Barley is but very little cultivated, but it is a good crop here when sown.

The hay crop was very fine last season, better than common—more than a general average.

All vegetables were very fine; never had a better crop of potatoes and cabbage.

ISAAC HEALE.

SHELBY COUNTY.

Dr. L. D. Morse:

SIR: This county is situated on the Hannibal & St. Joseph railroad, and is the second county from the Mississippi river. We have good facilities for market. There are some half a dozen thriving towns in the county, with plenty of good schools, and a first class male and female seminary at Shelbyville. We have also a large number of churches, embracing several different denominations. The general character of the land is fertile and easily cultivated, being entirely free from stones. The prairie and timber is well proportioned. We have two streams—Salt river and North river—which are running streams the year round. Black creek, the Fabios, and some smaller streams afford plenty of stock water, but are not constant running streams. The rivers and creeks have only soft water, but we have some springs which afford a constant supply of hard water.

Our timber is pretty well distributed throughout the county, being in alternate strips of timber and prairie, running parallel with the streams, which universally run a southeast direction. We have a good variety of oak, hickory, walnut, elm, maple, birch, sycamore and cottonwood.

Wild grapes, plums, blackberries, gooseberrries, strawberries form our principal wild fruits. We also have plenty of hickory nuts, walnuts and hazel nuts.

There are no government lands in the county. Number of acres of non-resident land, 113,300; number of acres of resident land, 176,750. The Hannibal & St. Joseph railroad company own a great deal of unimproved land in this county. There is a German settlement in this county which owns a large tract of land. They are quite extensive farmers, and do some manufacturing.

We have plenty of limestone of good quality. Coal is found along Salt river in large quantities. But one bed is worked. It is both cannel and bituminous, and the vein is 3 feet 5 inches thick, and near the surface. There are other beds from 2 to 3 feet thick. No indications of coal oil have been discovered, and there has been no experimenting for it. No other minerals discovered.

We have three flouring mills, six saw mills, one distillery, one tobacco factory and two woolen factories on a limited scale. But one of these mills is run by water; the remainder are all using steam.

Agricultural machines are very extensively used, and farming by machinery has proven to be the most profitable method of farming here, where it can be used to such an advantage, doing the work as well and often better than can be done by the old methods. Mowing machines are very generally used, embracing several different varieties, of which the Buckeye and Ball's are great favorites, and most generally used. The Champion mower is fast coming into favor. The Wood's mower is also used some. The old McCormick and Manny have gone out of date. But few reapers are used, as the farmers raise mostly grass. Horse hay forks are being introduced. Hay presses are not used, as the hay is all fed at home. Plows of several varieties are used, of which the Moline, Rock Island, and Battell & Boyd's plows, of Quincy, are very popular, besides a great many of home manufacture. The gang plow is being introduced with good success. It is but a practical step toward the successful steam plow, which we must sooner or later have here upon our western prairies. The sulky cultivators are becoming very popular. The Buckeye and the Hawkeye are the favorites. We have also the Stafford, of Galesburg, and the Waterman and Sucker State, both of Quincy. They are all admirably adapted to our prairie soil. The two-horse corn planters are in general use, giving entire satisfaction, and it is now no longer a disputed question that corn planted with a planter yields more to the acre than when put in in any other way. The Vandiver's Missouri corn planter is in most general use, and is a great favorite among the farmers. It was invented and formerly manufactured in this county, but is now manufactured in Quincy, by Barlow, Wood & Co. There has long been a demand for a machine to harvest the corn crop of our western prairies. The Butterworth corn harvester was invented in this county, and has been successfully introduced. It is the first practical machine for successfully harvesting this popular crop. It is also admirably adapted to cutting sugar cane in the south, it being simple in construction, and costing only one hundred dollars. It comes within the reach of every farmer, and is the last but not least of machines necessary for the raising of corn. By the aid of the corn harvester, in connection with other machinery, the farmers ride through the entire work. They can now ride and plow the ground, ride and plant the corn, ride and cultivate it, and now they can ride and cut the corn.

There are cultivators, plows, wagons and buggies manufactured in Shelbyville and Shelbina, but the demand is greater than the supply; and just here we would say here is a fine opening for manufactures, as we have plenty of good material and good facilities for shipping; there is also a demand for mechanics.

We have no agricultural society, but was interested before the war in a district fair with Lewis and Knox counties, which was very interesting and beneficial, but the grounds being destroyed during the war, the society has not been reorganized.

About one-fourth of the county is in cultivation. The first settlers invariably settled in the timber, along the streams, and after grubbing away for twenty years have no better farms than they might have had in the prairie in one-fourth of the time. Now the prairie alone is being improved. Some of the most magnificent stock farms in the state have been opened up on our beautiful prairies, with plenty of wild range and water handy, where the horses, cattle and sheep can eat, drink and be merry.

The average price of improved farms is twenty dollars per acre; the average price of unimproved land is seven dollars per acre. Timber is worth more, according to quality.

The population of this county is increasing. Of the immense tide of emigration flowing into our state Shelby county is getting a good share. Business is active. The spirit of improvement is being revived, and we will soon be as prosperous as before the war. Shelbyville, the county seat, is a place of some 500 inhabitants. The number of polls in 1866 was 1,429.

The principal productions are corn and timothy hay, while we also raise wheat, rye, oats, buckwheat, millet, Hungarian grass, blue grass and clover, tobacco, Irish and sweet potatoes, navy beans, sorghum, flax, broom corn, etc.

Wheat is not much raised. The attention of the farmers is more especially directed to stock raising, it being more profitable. The drill is not used, though I am confident that wheat can be successfully raised here with the drill.

Corn is our principal crop—an excellent quality of white corn for bread, and the large and small yellow for stock. Corn is mostly cut up for the fodder, and when fed to beef cattle, is fed

corn, fodder and all; for stock cattle it is husked out and the fodder fed separate, making an excellent feed, and so readily saved. The corn not cut up is husked or pulled off the stalk. None shipped. Our corn crop this season is good, and plenty of stock to eat it up.

Rye is but little raised.

Oats not so generally raised as in former years.

Enough buckwheat is raised for home consumption. Is considered impoverishing to the land. Yields well.

Potatoes grow well, though none are exported; the pinkeye, the peachblow, and the white nashannock are the favorites.

Hungarian grass yields well, though not fed to horses.

Millet is being grown to some extent, and also yields well.

The wild range dispenses to a great extent with blue grass, though it affords an excellent pasture.

Clover is used to some extent to revive old and worn out land. It grows well, though timothy is preferred.

Timothy is our principal grass, yields well, and is a very profitable crop, though it is all fed to stock and none for exporting.

Sorghum is pretty generally raised by the farmers, but there being so little market for sorghum molasses outside of home consumption, it is not very profitable. It is worked upon the iron cane mills, though most of the evaporators are of home manufacture. But little sugar has been made. The sorgho interest is not increasing any, but on the contrary, it is on the decline.

Hemp is not cultivated.

Flax is grown to a limited extent.

Tobacco is grown some, but little exported, being manufactured at home; the scarcity of labor prevents it from being more generally raised.

Cotton is not grown.

There is but little attention paid to the cultivation of hay and tame grasses for pasture, as there is an abundance of wild range as yet, though our prairie grass, when fenced up and pastured, is soon displaced by blue grass. Timothy yields a good crop of hay and affords excellent fall pasture.

Hedging has not been much tried. The Osage orange is considered to be the best, and will doubtless, ere long, come into more general use.

Sheep are beginning to receive their proper share of attention, although most of the large farmers and traders are more particularly interested in cattle or hogs. Almost every farmer has a few sheep, and there are, too, some considerable flocks in the county.

Mr. Dinsmore, near Shelbyville, has	1000
William Gooch, near Shelbyville, has	500
S. Vannot, near Shelbyville, has	500
The Germans at Bethel, have	800
Frank Harrison, Shelbina, has	500

Several others have smaller flocks. They are usually allowed to run at large on the wild range, though large flocks are herded. Stock sheep are not fed much, only when snow prevents their getting any grass. The wild prairie grass is thought not to be so good for blooded sheep as tame grass, though our stock sheep do well and are healthy, requiring less attention than any other stock. The farmers are beginning to improve their breeds. Dogs make great havoc in our flocks running at large, and something must be done. Dogs must be taxed to prevent this destruction.

Hogs maintain quite an important relation to the stock raising interests of this county. There usually being an abundance of mast, together with the immense amount of corn raised, makes hog raising profitable. Quite a large number are exported annually. They are usually marketed in St. Louis, Hannibal or Quincy, shipped alive. The farmers are taking quite an interest in improving their breeds, introducing the Poland and the Berkshire.

Cattle are very successfully and profitably raised here. Having plenty of wild range, and being convenient for shipping, gives us advantages for the raising of cattle not surpassed in the state. A great many cattle are bought up in the western counties, brought here and fattened for market. Cattle are our principal source of wealth, giving us a ready market for our immense crops of corn and hay. This county may well boast of her fine beef cattle that go into St. Louis and Chicago markets.

There are no dairies of any consequence in the county.

Horses are very plentifully raised, principally for draught and farm use, together with plenty of good carriage and riding horses—average price $150 00.

Mules are very profitably and quite extensively raised. Were marketed south before the war. In 1863-4 a great many were taken west across the plains; now they go through to St. Louis to the south again.

Fruit is being pretty generally raised. A great many have as yet young orchards. The interest is on the increase, as it is a very profitable as well as palatable production. Apples, peaches, pears and cherries grow well, and with proper care in selecting good varieties, we can equal some of our older fruit growing counties. We have apples of the very best. Peaches, fine, large and luscious. Pears as fine as grow in the state, with plenty of bright red and black cherries. The borer and the rabbits bother the orchards very much, but by dint of great exertion and a sharp lookout they may be baffled in their deeds of destruction. No fruit is raised for export yet.

There are no vineyards of any importance in the county.

We regret that we could not get any statistics from our assessor, as his report will not be complete until January, and we have had no statistical report since 1860 in our county.

We have presented a few items as best we could, giving a mere outline of the agricultural advantages, facilities and interests of little Shelby, though small in serial surface, ranks high in agricultural importance, comparing favorably with any county west of the "father of waters;" its beautiful rolling prairies waving with the green grass that feed "the cattle on a thousand hills;" our abundant wood lands, furnishing material for the mechanic and the farm; our endless supply of water fresh from the clouds of heaven, to quench the thirst of man and beast; the iron horse, traversing the county from east to west, hurrying off to market our surplus produce, and giving direct connection with our great western mart, the noble city of St. Louis. Our people are friendly, sociable and hospitable, and we extend an invitation to all the world to call and behold the beauties and advantages of little Shelby.

Very respectfully,

T. BUTTERWORTH.

SHELBYVILLE, January 1, 1867.

Dr. L. D. Morse:

DEAR SIR: Your circular of last month is received, and the desired information I cheerfully give to the best of my ability. Having consulted some of our farmer friends, we forward you the following report:

The general character of the spring was good—was considered a little late; the latter part of the spring was dry—no rains scarcely after the ground dried out, a few showers occasionally. The summer was rather dry—June, July and the early part of August affording a good opportunity to cultivate the corn and saving hay. The latter part of August rains set in—heavy rains falling until late in the fall. The first frost, September 20, injured a great deal of corn, as the wet weather kept it green until frost.

The fruit crop was good, except peaches. A full crop of apples, pears, cherries, etc. The peach crop was an entire failure. Grapes are not much cultivated. The cultivation of fruit is largely on the increase.

The relative condition of the crops is fair. Corn is light and chaffy, though a very large crop, in bulk full as much as was raised last year. Corn cut up before the frost matured well. Wheat is but little raised. Oats fair, but little raised. Hay crop good and well saved, having dry harvest, giving us a much larger crop of well cured hay than last year. Garden vegetables not so good as common. Altogether, we are pretty well off here in little Shelby, with plenty to eat, plenty to wear and plenty to do.

Yours, very respectfully,

T. BUTTERWORTH.

SCOTT COUNTY.

BY R. BAY WADE.

Dr. L. D. Morse:

Scott county is situated on the west bank of the Mississippi river, which river is its eastern boundary for nearly thirty miles. It has numerous fine landings, which are permanent and safe.

About one-third of the surface of Scott is high, rolling land, almost all lying so that it can be profitably cultivated—well watered and heavily timbered, the most valuable timber being oak and poplar. The poplar is of the finest quality and very abundant; I would not say inexhaustible, for it is so well adapted for building, and so generally used that the supply must finally give out. The timber next in value to poplar and oak is cypress. The supply of this timber is inexhaustible and generally of good quality, but is only found in that portion of the county called the "swamp," embracing nearly one-fifth of the surface of the county, lying in the southwest corner. We have another timber tree in this county not found in northern or central Missouri—the sweet gum; it is generally used for scantling, joists, rafters, etc.; it is not so durable as poplar when exposed. We have some very valuable black walnut timber, but it is not very abundant.

Of wild fruits we have no great variety. The persimmon is abundantly growing all over the county, and I may say the same of the pawpaw. Of wild nuts the black and white walnut, hickory nut, pecan and hazel nuts are found everywhere. I never saw any land more blest with wild grapes and the various berries. The principal varieties are blackberries, raspberries, dewberries, whortleberries, mulberries, strawberries and the serviceberry.

The soil in the high land is of excellent quality, the base or subsoil being clay of great depth. Wells are often dug fifty or sixty feet without striking rock. Excellent soft water is found in beds of gravel and sand at the old town of Benton, the former county seat. Many wells have been dug from thirty to sixty feet, always finding excellent water in abundance, but finding no rock except pebbles.

About one-fourth of Scott is called the sandy woods—is very level, the soil sandy—some of it unfit for cultivation. Much the greater portion, however, produces tolerable corn, and is the best cotton land in the country. It is traversed by numerous savannahs, which afford as fine grazing for stock as the prairies of Illinois. This sandy land is also the best tobacco land we have. I do not think any of our land well adapted to the growth of tobacco. The highest price paid for tobacco from this county last year was twenty-four dollars per one hundred pounds. Springs are numerous in the high lands, and the water good and soft, but none are found in the sandy woods, but water may be had anywhere by digging from ten to sixteen feet. Another region of country lying between the sandy woods and swamp is called Richwoods, embracing about one-seventh part of the county. This is perhaps the finest body of land in the county. The soil is black and contains enough sand to render it easily cultivated. It has a sand base or subsoil. The timber of this region is black and Spanish oak, hackberry, box elder, wild cherry, sweetgum and the largest sassafras I ever saw—some trees measuring forty inches in diameter. Its wild fruits, crabapple, wild cherries, pawpaws and persimmons.

Another section of Scott which deserves particular notice is the swamp, lying chiefly on east bank of Little river, which is the western boundary line of the county, embracing nearly one-fifth part of the county. The land of this region is extremely rich, the soil very much the same as the Richwoods, and the timber much the same. We find no springs in the swamp. Water in wells is good; but few wells are dug over sixteen feet deep. I forgot to say that the wells in the Richwoods are from twenty to thirty-five feet, and the water excellent. What distinguishes the swamp from the Richwoods is that it is lower and is traversed by numerous sloughs, which are, in wet seasons, filled with water and difficult to cross. On account of the richness of the soil and its adaptation to the growth of every kind of grain except wheat, and the growth of potatoes, turnips and in fact vegetables of every kind, it is a land of abundance—the best lazy-man's country I ever saw, yet it is pre-eminently a chill and fever region. Very little has been done toward reclaiming it, but enough has been done to show that it is practicable, and as much may be said of the swamps of Mississippi, New Madrid and Stoddard counties. When this is done it will be the Egypt of Missouri.

There is very little government land in the county, and it is worthless. There are some valuable tracts of land belonging to non-residents; cannot say how much. Our county gave fifty thousand acres of swamp land to the Cairo and Fulton railroad, one-third of which is quite valuable. The average price of improved land is about twelve dollars and unimproved lands four to five dollars per acre.

Gray limestone is abundant in the northern part of the county, and Messrs. Gray and Carter have an establishment on the bank of the river where they are making lime of excellent quality and in large quantity.

We have some valuable quarries of sandstone for building. Coal has not yet been discovered in this county. Iron ore has been found in many places, but not of good quality. No lead or copper has been discovered; no indication of coil oil.

We have one flouring mill at Commerce, owned by Geo. H. Watson; its capacity is 200

barrels of good flour per day, and one small flouring mill near St. Lawrence, owned by Charles Neissnear.

We have no implement manufactories in this county, except good plow makers, and the implements used here are of the most ordinary kind, except the latest patents of reapers, mowers, threshers, &c.

There is not now nor never was any agricultural society or farmers' club in Scott county. Not more than one-twentieth part of Scott county is in cultivation. The population of the county is nearly seven thousand. The principal productions are wheat, corn and cotton.

The average yield of wheat per acre among the best farmers is sixteen bushels; average yield in the county, ten bushels. Spring wheat is not cultivated; subsoiling has not been tried, but I know that it would do great good. The drill has been tried to a very limited extent, I think with favorable results. Under draining has not been tried. The aggregate amount made in the county is about 215,000 bushels.

The average yield of corn is thirty-three bushels; varieties, white and yellow. The yellow is preferred for stock near the river. The corn is hauled to the river and shipped to the south. In the interior it is fed to stock, generally in the ordinary way, and by some it is chopped; cannot give the aggregate amount raised.

Rye is sown chiefly for pasture; sown in August, it makes excellent pasture in this climate until near Christmas, and in mild winters until March. The yield per acre is twenty-five or thirty bushels.

Oats yield thirty, forty and sometimes forty-five bushels per acre.

Barley is a valuable crop here, raised in large quantites; the yield per acre is given at twenty to thirty-five bushels.

Sorghum has been extensively cultivated; two or three varieties, cannot name them. It flourishes best on black sandy soil. Sugar has not been made from it in this county. The implements used for its manufacture are, for grinding, the ordinary wooden crushing mill—some persons are using iron mills; and for boiling, large wooden boxes with bottoms of sheet-iron placed in rude furnaces. A few are using evaporators.

Hemp is not grown in this county. Flax is not grown extensively, but does well on our hill land.

Cotton has for the last four years been our best money crop; the sandy land, described in this report, yields the largest crop; it does not mature and open well in the clay land; the average yield per acre is about six hundred pounds seed cotton, or one hundred and sixty five pounds lint; our best cotton lands frequently produce one thousand pounds. It is selling now at our gins at seven cents per pound. We have five gins and four presses in this county.

Tobacco has never been grown extensively in this county; few of our farmers understand its culture, and I do not think the climate well adapted to it.

Sheep do well in the hilly portion of this county; we have, however, no very large flocks. No wool exported—no new breeds. Great injury is incurred by dogs, so much so as to greatly discourage sheep raising. I wish the dogs were taxed higher.

Timothy and herdgrass do well in the valleys, but meadows do not generally last long. Red clover is easy set and does extremely well for pasturage, and as a fertilizer. We sow it from the 20th March to the 15th of April, with oats; one gallon of seed to the acre. Once set it lasts well. No successful farmer is found without clover; very little is cut for hay.

Very little hedging has been done here; the Osage orange does well.

Of hogs, perhaps two thousand five hundred are driven to market; the average weight is two hundred pounds net; no improved breeds.

At least two thousand head of cattle are shipped each year; cannot give the number in the county; we have no dairies, and very few cattle of fine breed.

We raise hardly enough horses and mules to supply the home demand, no improved breeds being introduced.

Our hill land is nearly as well adapted for the growth of apples as any land in the state. We have a great many small orchards, but no professional fruit growers except Madison Williams, near Commerce. His orchard is paying well, and he is enlarging it. Peaches do well generally, but sometimes fail altogether—this season was almost a failure. Pears and cherries do well.

There are no extensive vineyards in the county; grapes do well about half the time; wet seasons they do not grow well, but rot. Wild grapes are very abundant and do very well.

In conclusion: It has been my aim in this report to avoid exaggerating the agricultural resources of this county, but I trust I may be excused for saying that I have traveled over the greater part of this state, and I know of no part of the state except that lying on the Missouri river, west of Boonville, the soil of which is so generally good as Scott, Cape Girardeau, New Madrid, Mississippi, Dunklin and Stoddard, and lying as it does upon the banks of the Mississippi for thirty miles, and being only thirty miles above Cairo and one hundred and fifty miles below St. Louis, the market

facilities of our county are hardly surpassed in the state. The farming until recently has been of the rudest kind. The common diamond plow is in very general use. The best imported plow is the Jewett.

Since the war closed we see some signs of increasing enterprise and energy. Land is being better prepared for wheat than formerly. The old way was to sow it down in corn and plow it in; now our best farmers break up the stubble land in August, very deep, then plow it again in September and October; sow the wheat and harrow it in, and the yield is almost double what it used to be.

Before closing, I would say that the most successful farmers we have are mixed farmers. Having sufficient land open, they keep from one-fourth to one-third of their farms in clover, one-third to one-fourth their land is cultivated in wheat, and raise enough corn, with the help of clover, to feed hogs for the use of the farm and a few for market, and raise a few colts or mules; also a small orchard, which hardly ever fails to pay well.

I neglected in the body of this report to mention the freed slaves. Most of the slaves left the county during the war. Those who remained were generally men with families, and were the most provident of their race. They are now generally doing well; most of them have set up business for themselves. I regret to say few of them are farming. Most of them are about the villages and towns. They do not make bad citizens; they seem generally to provide well for their families; their moral character is invariably good.

I regret that I have not found time to make this report more interesting, and to greatly abridge it.

SCOTLAND COUNTY.

MEMPHIS, Mo., January 3, 1867.

Dr. L. D. Morse:

With much pleasure I answer your questions contained in your circular addressed to me.

The spring of 1866 was rather cold, also rather wet—considerable rain, and but few thunder-storms. The summer of 1866 was quite pleasant—not so warm as common; quite seasonable as to moisture and heat. The autumn of 1866 was rather cool, but a very pleasant fall, and considerable rain in early autumn.

The apple was the only crop raised this year successfully; a full crop I presume of this fruit. No peaches. But few pears and grapes. The scarceness of the two latter fruits is the want of cultivation. I am satisfied the grape will yield well, and none have been winter killed or troubled with blight or rot. We had some fine grapes at our county fair last fall however, but few are cultivated in the county. I am quite certain we have in our county several thousand acres of land better adapted for grapes than any other production. These lands could be bought for perhaps two dollars per acre.

The cultivation of all fruits is rapidly increasing in our county.

Corn and oats are the principal grains raised in this county; corn was excellent last year. Oats abundant; the two last crops are much larger per acre than has been raised in this county for years. Hay crop was good, better than the average. Corn, one-half crop. Oats, over average. Hay, over average. Wheat is but little grown. Barley, none.

Yours, truly,

W. D. SIGLER.

ST. LOUIS COUNTY.

FOX CREEK P. O., ST. LOUIS COUNTY, Mo., December 29, 1866.

Dr. L. D. Morse:

SIR: Your circular reached me a few days ago.

It would be of no value to your report to give anything but outlines till something like a reg-

ular, general system of observations can be undertaken, and this will require time and money, men and instruments, and these will be hard to obtain. If your office can, however, show how much cannot be done and needs to be done, it is going a step in the right direction.

The spring was rather late, but, on the whole, fair; summer very dry, then very wet, with the extremes of heat and cold. The averages are not so extreme as the variation. Autumn was fine and long continued, but the wet caused wheat to be put in so late that notwithstanding the fine fall it is, as a whole, feeble, and is not in good condition to stand the winter. Very early sown wheat is very fine, but with us the area is very small.

The fruit crop is deficient and inferior; apples, half crop; peaches, one-eighth crop; pears, three-fourths crop; grapes, three-fourths of a crop of all but Catawba. Grapes are considerably cultivated. They did not suffer much from rot with me, but to the extent of the loss of three-fourths to my neighbors, especially the Catawba. The cultivation of fruit is increasing rapidly. There has been fifty per cent. more planted here than in any one season before.

Corn, seven-eighths crop, quality soft; wheat, three-fourths crop, quality very good; oats fair; barley, don't know; hay, very good. The crop, as a whole, is inferior to last year's, except hay, which is better.

Insects are doing increased mischief each season in grain, vegetable and fruit crops.

Bees have been very poor stock for the two last years.

I am, sir, yours, most respectfully,

WILLIAM MUIR.

VERNON COUNTY.

NEVADA CITY, Mo., October 20, 1866.

Dr. L. D. Morse:

SIR: When, in reply to your letter under date of August 20, I promised to make the report desired by you, I thought but little of the nature of the promise. In attempting to comply, I find I am utterly incompetent to the task. You will, therefore, excuse the manner in which it has been abbreviated, with nothing in its praise unless a desire to benefit my neighbors should be so.

This county contains between 900 and 1000 square miles of territory, with a gently rolling surface of light, sandy loam and coarse black limestone soils, of about two-thirds of the former to one-third of the latter, with one navigable stream, the Osage, on its northern border. The surface of the county is agreeably divided between timber and prairie, and by little streams of water meandering from every point of the compass, and emptying into the Marais des Cygnes, Little Osage, Marmaton and Clear creek, the latter three of which, running a northeast course, penetrate through the entire county from south to north, and afford all the power for manufacturing purposes that can be desired.

The spring and well water is soft and lasting; the latter is procured with very little or no blasting. Springs are only found in localities where the surface becomes more rolling, and, in such places, are durable. They embraced all the varieties of water, such as the white and black sulphur, chalybeate, lime and freestone.

The black walnut, pecan, shellbark, overcups, bur oak, etc., of great size, covering the creek and river bottoms, while the adjoining higher grounds are covered with the post oak, white oak, black oak and black and white hickories. The crab apple, various kinds of wild plum, haw, service and winter grape cover the heads and borders of the creeks, while the heavier timbered grounds produce many varieties of the summer grape, blackberry, whortleberry and persimmon in great quantities and fine flavor.

It is believed there is no government land in this county, but about three-fifths of the territory is owned by non-residents, who are slowly offering their lands for sale through their agents residing at our county seat, at prices ranging from two to five dollars per acre. The settlers own the timber and prairies immediately adjoining, which, as a general thing, contain all the land now in cultivation. These farms are selling at from six to twelve and a half dollars per acre.

Limestone rock is found in all the prairie mounds, and in the beds of many of the streams in vast quantities, and suitable for any building purposes, while the soft sandstone, in layers from two o eight inches, shows itself in nearly all parts of the county. The blue grit sandstone or grind

rock of the eastern part of this county, has been shipped to all parts of this state and Arkansas for the last twenty years, for sharpening fine-edged tools, and works equally well with water or oil. It embraces such vast quarries that it is believed to be inexhaustible, and will in course of time certainly be a revenue of great wealth. The gray, blue and variegated marbles, which are subject to a high state of polish, are also found in the western part of the county, but are not yet opened to any extent.

Coal is found in the sides and beds of washes in almost all parts of the county. The northern and western half is believed to be one vast bed, which is found from two to ten feet below the surface, and is much used for fuel. This vein, which is known to cover at least an extent of two hundred thousand acres of land, so far as examined at different points, has been found from three to six feet in thickness.

Lead ore shows itself on the Osage river in small quantities, exceedingly rich, and also on Clear creek, but this ore has never been sought after, and only discovered by being washed out of the soil by heavy rains. Lead tiff is abundant in many localities, and is brought to the surface by the crawfish.

In the white oak timbered localities the rock appears to have been once melted, which is supposed to contain a considerable part of iron. Springs issuing from this soil are chalybeate, containing properties of this mineral. If no error is made in the properties of the rock and water, this ore is inexhaustible. The sulphur springs also throw out quantities of a very bright and heavy mineral, once having been melted, which is believed to be mainly sulphur.

Copper ore, or what is believed to be such, has only been found on two adjoining farms. This has been struck by four different shafts sunk for the purpose of getting better water than the springs afforded, the water from them tasting of copper. The ore in these wells was struck from twenty to thirty feet from the surface, according to the inequalities of the ground, and appeared to be a solid mass of melted yellow metal, upon which the drill or chisel had little or no effect. No futher attention has been paid to it, except to compare with some ore from the Duck river mines of Tennessee, which I was told was identical.

Several springs in the eastern part of the county are strongly impregnated with coal oil, and the two known as the Dunigan springs, one a tar and the other an oil spring, I will attempt to describe. They are situated about one mile from each other, the tar spring on lower ground than the oil spring, with mostly a gradual descent. They have been known for twenty years, and used by citizens for old sores, sprains, bruises and the like, seeming to act like a charm. The tar has also been used on wagons, wearing well, and obviating the necessity for other grease. The latter seems to rise even with the surface, from a round hole about two feet across, and is so thick as not to run, but is readily cut with a spade. On a quantity being taken out, the tar rises to a level with the surface again, as though the under pressure was just sufficient to bring it that high and no higher. Whether the spring would soon become exhausted or not is not known. The oil spring runs an undiminished stream of water, with floating drops of oil on its surface, which is readily gathered by cloths. No experiments have ever been made in boring for oil, or attention given to it in any way; in fact, we have never had a single person sufficiently interested in the minerals to gather them and have them analyzed.

There is at present not a single flouring mill in the county, and but one mill of any kind in running order, which grinds a little corn and has a circular saw attached. No foundries, factories, carding machines, etc., are in existence, the war having swept away public buildings of every description, as well as the better private ones, causing a lack of energy for want of capital among the citizens, which years can hardly supply. Many fortunes are in store for the new settlers who will bring the industry and capital to supply the demands for mills, factories, blacksmith shops, etc., etc.

But few farmers are able at present to buy the implements so necessary to farming in this prairie country. What few we have are used with great success, and the purse is the only drawback which precludes each farmer from working his gang, subsoil and sulky plows, mowers, reapers, etc., etc. They are all used to a small extent, and attract the admiration and envy of every farmer. A neighbor, Mr. Lowe, this year (1866) broke, planted and tended sixty acres in corn without an hour's help, by having a planter and sulky plow, doing the labor well and with more ease to man and team than is usually expended on one-third the ground. It is believed there has not been a plow or hardly a farming implement made in this county since the war.

An agricultural society was started in this county, and one or two fairs held before the war; since which time (last spring) the society reorganized, getting a good support from the county and farmers generally, and was enabled to hold a three day's fair this fall, giving as a prize list between four and five hundred dollars (see accompanying list with constitution, by-laws, etc.,) in pure silver ware made for the society by Mr. ——, of St. Louis. This was a stimulant little expected by this

and the adjoining counties, and gave great satisfaction, bringing out quite a display, particularly the second and third days, in cattle and horses. The prizes for these were ten and fifteen dollars for each ring, and the quality of the stock surprised all present. Mr. Harvey Karnes, president of the society, F. P. Anderson, secretary, Colonel A. A. Pitcher, John Brown, etc., as directors, are all deserving much praise for the labor they have expended in reorganizing the society and making it what it is; and under their management we expect to see next year a greater degree of interest manifested than ever before.

About one-fiftieth part of the county is supposed to be in cultivation, or ten thousand acres, while the timber covers about fifty thousand acres, leaving four hundred and forty thousand acres of the finest prairie lands in the world, hardly an acre of which is not susceptible of a high state of cultivation; showing at least the vast amount of produce which could be furnished from this county alone.

The number of inhabitants at present is not known, but has probably increased one-fifth since last fall.

The principal productions are wheat, corn and oats, while potatoes, tobacco, rye, buckwheat, sorghum and cotton are raised in small quantities for home consumption. The average yield of wheat per acre this year by the best farmers is believed to be twenty-two and a half bushels, while the average yield through the county will be twenty bushels. Fall wheat is principally cultivated, although spring sowing usually does well. The aggregate amount raised in the county is not known. The drill has not been tried, neither has underdraining. Subsoil plowing by the older and better farmers is known to have the very best effect upon their crops—quite equal if not superior to a coat of manure, the vegetation showing to the very furrow for years after. In fact the Missouri prairies, so long exposed to the heat of the sun, together with the fires which sweep from their surface each fall large growths of vegetation, leaving a mass of dead earth covered with leached ashes, only require the subsoil plow to make them the richest and most productive lands in the world. No underdraining as a usual thing is required, while the subsoil plow is necessary on every farm.

The average yield of corn per acre through the county is supposed to be about forty bushels for this year, although some farmers will make from sixty to seventy bushels. The varieties preferred are the large white for bread, and large yellow for stock, the latter yielding about one-eighth more per acre in weight. The aggregate amount raised in the county is not known, but there is sufficient to supply the present inhabitants for two years. No exports of corn are made from this county. What the inhabitants do not consume is thrown to stock in the ear.

The soil in this county is particularly adapted to oats and rye. In no state in the Union have I seen anything to be compared to their growth here. The probable number of bushels raised to the acre is not known, the farmers not pretending to thresh more than they require for seed. Eighty dozen and upward are usually raised from an acre and fed in the sheaf.

Irish and sweet potatoes grow to great perfection, and with little labor, but the former does not yield as large as in colder climates. They are only raised for the table.

Sorghum is only planted in small patches, and for molasses alone. It grows with little labor to a fine size, and our wooden roller mills, with the assistance of the family and three or four small kettles, generally give us from eight to twelve gallons of fine molasses for our labor each night, until the patch is made up. One hundred gallons is the average yield for each acre of cane. The molasses is considered equally as good as the New Orleans, and sells readily for one dollar per gallon at the door. The small black head is the most popular, as it makes molasses more or less grained with sugar. All soils seem to be equally adapted to it.

Tobacco is only grown by one or two farmers in each settlement, who supply their neighbors at about twenty cents in the hand, or forty cents manufactured, each raising from one to three acres of a kind which is the largest and heaviest, averaging nearly one pound to each plant; it is hung in barns as soon as wilted, and cured by fire. For chewing purposes it is certainly not far behind the best brands brought from St. Louis, but the art used in giving it the rich brown color and flavor is best known to the producers.

This county is known to be all that could be desired for sheep raising, never having what is known as the rot in colder climates; the rich pasturage, furnished by our rolling prairies both summer and winter, requires but little feed, and by sheltering through our worst storms, gives our sheep a healthiness which is seldom attained in other climates and pastures. I have never failed to have lambs twice a year in my flock of twenty or thirty with this treatment. We are much troubled with prairie wolves, and herders would be necessary to those with much capital invested in this stock. Our wool is all consumed at home, readily selling at fifty cents per pound at the door.

The tame grasses, particularly timothy, redtop, Hungarian and blue grass, have been tried with great success. Timothy and blue grass seem to be the favorite grasses, and well they should, as the latter readily eats out the grass of our prairies, and in a few years spreads in all directions, while

the former, sowed in September or October, produces the next, and for several succeeding years without any further trouble, a large crop of hay. Heads of this grass raised by myself here have been measured that grew fourteen inches in length, and the same meadow, it was believed by Mr. Ray and Jarle, the parties who cut it, would average in length of head nine inches. This meadow grew to about the hight of a man's head, was the first crop, and was sown on high prairie, the land subsoiled, but never manured. No weight has ever been made of hay in the county; the yield per acre is therefore unknown. The crop mentioned above grew on a sandy loam with a red clay foundation, about twelve inches from the surface.

Thousands of head of cattle are yearly driven from this county, in early spring, to the different points on the border, to be used as oxen in conveying the immigration to the vast west, or to supply the great demand made by government for transporting supplies. In summer and fall a constant stream of beef buyers are leaving with droves of fat cattle for St. Louis, or with poorer ones for other points in this State, Illinois or Ohio, to be fattened. Thus is a daily market opened at every door, which, before the war, supplied the farmer with all the money his necessities required. No idea can be made of the number driven to market from this county; certainly not a fourth as many as before the war, yet the numbers are great. They are raised to sell for oxen or beef, and not for dairy, the farmers permitting the calves to run with the cows, and not only have the advantage of all the milk, but of the fine grasses produced by our prairies, thereby adding greatly to their growth. In this way some of the finest two, three, and four year old beef is raised, which finds its way to the eastern markets. The farmers here have depended more upon their rich pastures than on their breeds of cattle; but those few who have tried the blooded stock have been able to sell at such advanced prices that others are dropping in, and I have no doubt a few years will entirely change our breeds. Mr. B. F. Peppers and John Brown, of this county, are certainly entitled to great credit for the introduction of some of our finest Durham cows and bulls, and we were pleased to see them bear off all the prizes given for cattle at our late fair. The former named gentleman has since sold six of his two year olds to Mr. R. W. McNeil, a neighbor, for three hundred dollars—a very low price. Mr. McNeil has between five and six hundred head of cattle on his farm, mostly cows and stock cattle, the income of which is no mean sum; he is one of our largest stock raisers. We have no means of knowing the number of cattle in the county, but certainly nearly every farmer in it is endeavoring to increase his stock, which they may do twenty fold, and still have thousands of acres of untouched pasturage. It is believed at the present prices near one hundred per cent. is made on the capital invested; certainly a great inducement to increase their flocks. At least four-fifths of the cattle in this county were lost in the war.

There is not a supply of horses in this county, the war having swept them all away. The few here have been brought from other parts, and the demand is good for all kinds. Previous to the war many droves were taken to the southern markets yearly.

There are no professional fruit growers here. The farmers are slack in getting grafted trees, although we have as fine fruit in a few orchards as can be found in the state. Our experience convinces us that trees brought from colder climates will increase not only the size of the fruit but the flavor. Orchards here should not be cultivated after the tree attains any size, but sowed in some tame grasses.

This county, at present and for years to come, no doubt, will be the great pasture on whose succulent grasses the numerous herds of beef and mutton will be raised and fattened for the great eastern cities; and so long as this pasture continues, but little improvement will be made in agriculture. No finer climate or soil can be found on this continent for raising hemp, tobacco, corn, grasses or fruit than this; yet the observing new settler readily sees what the older settlers know, that the greater wealth consists in having some species of stock to graze upon the tender grass of our prairies in summer and the tall, rank green grass of our river bottoms in winter. A desire is, therefore, evinced by every farmer to increase his stock of cattle, no matter how small his capital—which he does to the neglect of everything else. This accounts for the little interest taken by the extreme western people in internal improvements—a majority of whom are opposed to railroads upon this principle alone, that it will bring into the market the large tracts of prairie lands owned by non-residents, dividing them into small parcels and bringing them into cultivation, thereby destroying the vast pastures over which their cattle now roam summer and winter free from expense to themselves or annoyance to others; and all soon learn that while their yearly income has not been diminished since their arrival here, it has also saved them many weary days of labor in the harvest field.

The greatest drawback in this county is the want of capital and labor; the one would soon produce the other, but of that one thing needful this county is certainly far behind any other in the state. A border county, with its prairies thickly dotted with droves of horses, mules and cattle, the war induced the lawless from every point to prey upon its herds, which resulted in the destruc-

tion of nearly every dollar in capital, except that invested in real estate. Time and industry will supply the losses, but it is far distant; and a little capital now would create an impulse adding years of advancement to the prosperity of our county.

The wages paid by farmers this year has been about one dollar and a quarter by the single day, and about twenty-five dollars per month by the season.

We have but few freedmen in the county—those few live with their former masters, performing the same duties and receiving the same treatment as before the war.

Respectfully,

ALBERT BADGER.

WAYNE COUNTY.

COLD WATER, January 22, 1867.

L. D. Morse, Esq.:

MY DEAR SIR: In response to your circular of June, 1866, I send you the following answer concerning Wayne county:

The general character of the face of the county is rolling; our soil being divided into two classes—bottoms and hills. The bottoms, generally along the water courses, are large and of great fertility, easily cleared and cultivated. About one half the county may be said to be botttom land. The hills are broken and rough—mostly of volcanic and mineral formation—and are unfit for the purposes of general cultivation; but are rich in minerals, and covered over with immense pine forests of great value for lumbering purposes.

St. Francois, Black and Castor rivers run through the county, as well as some nine or ten other large and constantly running creeks, making it one of the best watered counties in the state, and affording water power enough to run the factories of the world. The water power, taken in connection with the heavy pine and other forests through which these streams run, render Wayne county a most desirable location for lumbermen and mechanics generally.

Our forests furnish us with an almost inexhaustible supply of pine, cedar, hickory, ash, white and black oak, walnut, sugar tree, gum, hackberry, maple and poplar, together with a great variety of other timber and vines; among which latter there are many varieties of grapes, and some almost as large and well flavored as the tame grape. Indeed, our hills and broken lands, with our favorable climate, are the very best regions of the state.

There are yet some government lands in Wayne county. Good unimproved lands can be bought for two dollars per acre, and from that up to ten dollars. Improved lands from four dollars to twelve dollars per acre, varying on account of location and improvement.

Iron is the most abundant, and will some day yield large profits to those who have the capital to engage in its manufacture. Lead is also found in small quantities, and, no doubt, will eventually, when proper investigation is had, be found in great abundance. Copper mines were worked before the war; but owing to lack of capital to procure the necessary machinery, and to the fact that no means of transportation are yet convenient, they have been temporarily abandoned. But as the Iron Mountain railroad is now being extended through the center of this large county, new life and energy will be given to the development of our vast mineral resources, as well as our lumber and agricultural interests. Heretofore, owing to swamps on the east and mountains on the north of this county, we have been shut entirely out from the Mississippi river and from railroads. But now a new day has dawned on us, and a railroad is being extended through the entire length of the county, tapping our mines and passing through our pine forests.

Some seven or eight saw and grist mills are at work in the county, propelled by water, and two by steam.

Our implements are mostly poor and old fashioned. No factories or machine shops in the county.

Population about five thousand. But one-tenth of the county in cultivation.

Our principal productions are wheat, corn, tobacco, cotton, hemp, oats, barley, potatoes (Irish and sweet), fruit and sorghum.

The average yield of wheat per acre is about eighteen bushels. Fall wheat entirely used. I have never known spring wheat tried in the county. With good cultivation and improved machinery, our land will produce thirty bushels to the acre.

Corn will average fifty-five bushels to the acre, with poor cultivation; in many instances ninety to one hundred bushels have been produced per acre.

Rye is about the same yield as wheat. Barley about fifteen bushels per acre. Oats about thirty bushels.

Sweet potatoes grow unusually large, and do well. Irish potatoes do well, and yield about two hundred bushels to the acre. The dry rot, so fatal to this plant, has never been known in Wayne county.

On river and creek bottoms hay does well, and will yield from six to eight hundred pounds per acre.

Flax does well—none sent to market.

Sorghum is raised on every farm, and is the best paying and easiest raised crop in the county; redtop generally used.

Tobacco is raised on almost every farm, and yields about fifteen hundred pounds to the acre—a sure and profitable crop. If the farmers of southeast Missouri would improve their tobacco farms, and pay a little more attention to the curing of this crop, they could produce an article in no way inferior to the celebrated James river tobacco. To men of enterprise who understand the tobacco business, we would say that a few tobacco stemeries, etc., would pay well in our county.

Cotton does well in the southern part of the county, and has paid large profits to the raiser during the war; but it is an uncertain crop, as the frosts come too soon for it to mature.

Hemp does well, but not very largely raised.

Hogs are very profitable, owing to large forests and good mast. Hogs do well, and only require feed enough to keep them gentle; mostly of a poor stock. Hog cholera scarcely ever known in this county.

Sheep do well, except for wolves; generally of poor or scrub stock.

Cattle are easily raised and very profitable, as the climate is so mild that cattle can live through the winter, though in the spring they look poor; but when properly cared for do well; mostly scrub stock.

Horses do well and are easily raised, but all the good stock was stolen by the rebels during the war.

Heretofore, there being no market for fruit, orchards have been neglected; but with the introduction of our railroad, and with our climate, large profits are expected from peaches and grapes, in particular. Other fruits do well. Peaches are never known to be a total failure in this county.

Taking Wayne county as a whole—her mild climate, fertile soil, rich minerals, many forests of pine and oak, with her great facility for water power, and her close proximity to St. Louis by railroad, together with her present cheap lands and loyal population, I would say that she offers as great inducements to the industrious man seeking a home as any county in the state, and to all such we would say, come and see for yourselves.

With great respect, I am, sir, your obedient servant,

JAMES S. McMURTRY.

WEBSTER COUNTY.

NOVEMBER 24, 1866.

It is with much diffidence that I attempt, in compliance with your request, to make an agricultural report for this county, and undertake it only after unavailing efforts to induce some more competent person to do the service. The natural endowments of the county are so great that to attempt to portray them overwhelms me with a sense of my incompetency. The chaotic condition of agriculture makes the attempt more uncertain and difficult; no estimate can be made with any degree of accuracy, and having been engaged in farming myself but one year, and that under many disadvantages, my own experience covers but a narrow field, and makes the source from which I get material for this report very limited. I hope I shall receive indulgence for this sorry effort, particularly from those citizens of this county whose position and information would have enabled them to do the county some service, if their own penuriousness and narrow selfishness were not so great as to forbid them interesting themselves without a fair pecuniary reward.

Webster county is situated on the Ozark mountains, 37° 15′ north latitude and 15° 45′ west lon-

gitude from Washington. Its boundaries are Greene county west, Dallas and Polk on the north, Laclede northeast, Wright east, Taney and Douglas south, and Christian on the southwest.

The general character of this county, in reference to the division of the soil, may be stated as follows: Perhaps eight-tenths of the tillable land is bottom and timbered upland, four-fifths of which is or can be made available for agricultural purposes. In its topography it is principally rolling, and often hilly and abruptly bluffy, interspersed with springs, creeks, ravines, vales, and smooth bottom lands. The soil is variable. In the bottoms it is usually a rich, dark loamy soil; on the uplands, hills and bluffs. It is a dark silico-argillaceous and vegetable soil, slightly stony; in some instances it might be called a drift soil.

In the southeastern part of the county there are several large, durable springs of soft water. In these the Niangua and Osage fork of the Gasconade find their source. They run north through the entire width of the county; from twenty to thirty feet wide, two to eight feet deep, and current three miles per hour. They furnish available water power only for very light machinery. Others of these springs feed the James and Finley, which traverse the county, running in a western and southwestern direction; from twenty to forty feet wide, with a current from two and a half to three miles per hour. The former stream furnishes available water power only about two-thirds of the year; the latter constant and regular. This stream (the Niangua, Osage fork, James and Finley), receives continual accessions from the many springs of pure soft water that well up in nearly every section and quarter section along their entire course. The Pomme de Terre rises in a large spring in Pleasant prairie, one mile west of Marshfield, the county seat; runs west six miles, then northwest on through the county. The numerous tributaries of these streams furnish an abundance of water for stock and manufacturing purposes.

The bottoms sustain a heavy growth of timber, such as ash, linden, buckeye, box elder, sycamore, cottonwood, American slippery and whahoo elms, honey locust, hackberry, common thick shellbark and pignut hickory, black and white walnut, redbud, maple, mulberry, bur, white, swamp white, chesnut white, red and pin oak, pawpaw, plum and the summer and fox grapes; while the highland is timbered with white, chesnut, black and blackjack oaks, common and black hickory, ironwood, redbud, persimmon and dogwood. Timber exists in sufficient quantities to supply all the necessary demands for its consumption.

Of native wild fruits we have the following varieties: Crab apple, wild cherry, plum, black and red haws, persimmons, raspberries, blackberries, strawberries, dewberries, gooseberries and serviceberries.

Of shrubs we have the following: Hazel, black and white sumach, spice wood, red and black haws, sassafras, wild plums, serviceberry, dogwood, crab apple, redbud, white and red roses, thorn and several willows.

We have of vines, summer, winter and fox grapes plenty; honeysuckles, hop vines, and two or three kinds of creepers.

Of government lands we have one hundred and fifty-four thousand six hundred acres. There are perhaps fifty thousand acres of land owned by non-residents—perhaps more or not so much. I cannot obtain the exact amount, owing to the tax books being inaccessible. Every even section, except section sixteen, in six miles of the survey of the Southwest Pacific railroad, is owned by the Southwest Pacific railroad company. The total number of acres of these lands is sixty-five thousand three hundred and eighty. A large portion of these lands are held by pre-emption. Of school lands there are fourteen thousand and eighty acres, about one-half of which has been entered. The area of the county is five hundred and six thousand eight hundred and eighty acres. The price of improved lands is from five to fifteen dollars per acre. Unimproved land sells at from three to ten dollars per acre.

Of minerals we have a variety of the magnesian limestone—generally "cotton rock" in this part of the state, of a cretaceous nature, insomuch that it may be burned into chalk, underlies the greater portion of the county, particularly the western portion of it, from three to twenty feet below the surface. It lies in thin, regular strata. These strata crop out along the bluffs of the Pomme de Terre and its tributaries; also along the Osage fork of the Gasconade. It is valuable for building purposes, and is soft and easily wrought when fresh from the quarries, but becomes hard on exposure.

There is a rough, porus silicious rock, of the family of limestone, which promises to make good mill burrs. This stone lies in a strip from one mile to one and a half mile wide, running from southeast to southwest through the county. They have been used in several instances in the southwestern counties for mill burrs, and have been found to be good. I think, if manufactured in the same manner as the French burr, they would be equally as valuable.

Saccharoidal limestone, of a yellowish brown color, exists in considerable quantity; it is used to make brick in cement and mortar.

We have other limestones, of which quick lime is burned. There is also a small, smooth silicious or flinty rock, that covers many of the hills and bluffs, and forms the beds of our streams and underlies the surface, and forms a strata above and contiguous to the "cotton rock."

We have no coal veins opened, and I don't know that we have any. The only evidence we have of the existence of coal is in township 30, range 13, where, on a ridge about four feet under the surface, several years ago, a small quantity of stone coal was disembedded, and in the bed of the Pomme de Terre, on two or three instances, stone coal has been picked out from where it had been exposed by the wash of the current. There have been no further examinations made.

Colonel J. W. McClurg worked a lead mine at Hazelwood, in the southeastern part of the county, a few years before the war, with profit, but was forced to abandon it on account of the water interfering with the miners. With the proper machinery to free the mines of the water, they would yield a rich return. Colonel McClurg took out some lead on the Finely, in the southern part of the county when he was working the Hazelwood mines.

Lead has been found all over the southern and western portions of the county. Along the bluffs of the Pomme de Terre and tributaries, a few years ago, the hunter picked lead from which he molded bullets to shoot the wild deer and turkey. There is no doubt but lead exists in the county in great abundance, and only awaits capital and skill to develop a bountiful source of wealth. No indications of coal oil.

Four flouring mills and several others are needed.

Manny's and McCormick's combined reapers and mowers have been used in a few instances, and with perfect satisfaction. Patented cider and sugar mills of several kinds are used. The dismond, shovel and bull-tongue plows are mostly used, and are manufactured by any blacksmith. Smith's cast-steel plows have been introduced the latter part of this season, and give entire satisfaction.

We have no manufactory of agricultural implements; this county would be a favorable location for such a manufactory.

No such thing as an agricultural society, farmers' club, or horticultural society has been known in the history of this county, and all attempts to organize one have been ineffectual; nor have we had any fairs.

Our principal productions are corn, wheat, oats, rye, sorghum, potatoes (sweet and Irish), tobacco, timothy, herd grass and clover. Of fruits, the apple, peach, pear, plum and cherries. Domestic animals are sheep, hogs, horses, mules and asses.

Corn, by the present shallow mode of culture practiced by most farmers of this county, yields an average of about forty bushels per acre; with the best farmers it often produces above eighty bushels. It is usually fed in the ear to horses, mules, cattle and hogs.

Fall wheat is sown. The Walker wheat is mostly sown, and is in high favor, yielding, with the best farmers, from twenty-five to thirty bushels per acre; average yield in the county, about fifteen bushels per acre. Neither subsoil plowing, the drill, nor underdraining have been tried.

Oats succeed well; the average yield per acre is about forty bushels.

Sweet potatoes yield about two hundred bushels per acre when properly cultivated. Irish potatoes produce from two hundred to three hundred bushels per acre.

Sorghum is cultivated very generally for home consumption, which it mostly supplies. It yields from seventy-five to one hundred gallons per acre. Several varieties are cultivated, without any particular one being preferred. No sugar has been manufactured from it. Wooden and cast-iron mills are use used for grinding the corn, and iron kettles for boiling it.

Hemp and flax have not been cultivated.

Cotton has been cultivated in small quantities for domestic purposes. It succeeds best on a light, sandy soil.

Tobacco is grown for market in this county to the amount of about one hundred thousand pounds per annum. Fine manufacturing tobacco is mostly raised. The average yield per acre is about one thousand pounds; is generally fire-cured. Previous to the war, several premiums were awarded to tobacco raisers in this county for the finest tobacco in the St. Louis market. It is not generally regarded as being peculiarly impoverishing to the soil; a fact which would not be recognized by tobacco being generally cultivated on new land, and but one or two crops grown on the same ground. I think, however, from the large quantity of ashes produced by burning the stalks and stems, and there being no part of the plant left upon the land to compensate for the matter extracted from the soil to feed the plant, that it must be much more impoverishing to the soil than any of the other standard crops. This fact will not be much regarded as long as the production of tobacco is as profitable as at present, and if the present mode of cultivation is continued, future generations will suffer but little from gout.

Every farmer has a small flock of sheep. They are very healthy, and require but little care

and attention, and requiring to be fed only a few weeks in the middle of winter. No improved breeds have been introduced. No large flocks. No serious injury has been incurred by dogs. Sheep raising in this county can be made one of the most profitable branches of husbandry. The ridges are dry and covered with nutritious grasses; the seasons are warm and mild, and suitable water convenient on every hand.

There is some attention paid to the cultivation of timothy, herdgrass and clover, with excellent success. They have this advantage over the wild grasses: they furnish pasturage late in the winter and early in the spring, when the wild grasses are withered and dried. The herdgrass and clover are best for pasturage, and timothy for hay—yielding two tons or more per acre. Hungarian yields from two to three tons per acre, but is not much thought of here by our best farmers. It is very injurious to stock—horses particularly, which it almost invariably kills after being fed on it twelve or eighteen months.

I don't know of hedging being tried in but one instance. This was the Osage orange, planted several years before the war by Mr. Ephraim Clock. It was never cultivated nor pruned, but allowed to grow among other brush, without any care or attention. The only thing necessary to have made it a success was the ordinary care and attention. They are not injured by the winters in the least, but seem as hardy as any of the native growth. It is believed that the Osage orange will succeed well here for hedging.

Hogs are very scarce here now. They were almost entirely swept away by the war, and the supply now is hardly sufficient for home consumption. Before the war, there were a great many driven to market each year. The average weight has been about two hundred pounds. We have mostly the common scrub stock. The Berkshire and China have been scattered through the county.

I have no data from which to ascertain how many cattle have been driven to market. Previous to the war, which almost exterminated them, there were each year a great many driven to market; perhaps three thousand per annum—not more, however. The Durhams have been bred several years, have greatly degenerated for want of care and attention. No dairies, but excellent facilities for them offered by the abundant pasturage and pure springs.

The war came nearer sweeping away horses and mules than any other species of property. Now the most invaluable scrubs take the place of the proud, noble steed of former years. Prior to the war, I suppose there were about one thousand head of mules and horses driven to market annually. Draught and saddle horses have been mostly raised. Now there does not seem to be any especial effort made to improve the breed.

All our best farmers are cultivating small orchards, which are doing well. They generally come into bearing in about three or four years. Apples, peaches and pears grow large and are of good flavor. All who are putting out orchards are trying to get improved varieties of the apple. Peaches are large and well flavored, but are generally seedlings.

We have no vineyards in the county, but the good quality and abundance of the wild grape growing spontaneously all over the county would indicate that there is no better location for wine growing in the state. The flat ridges, the flinty hills, the picturesque bluffs, and the rich alluvial bottoms, all are clad with grape vines.

Farming has not improved much in this county. We are still prostrate under the blighting curse of treason that has so mercilessly scathed this county, in common with all southwest Missouri.

Horses, mules, cattle, sheep and hogs have been driven off or killed; fencing, barns and houses have been burned; implements worn out or destroyed; taxes accumulated on lands during the war have been to pay; but that patriotic and pioneer spirit, active in regenerating, building up and refitting their dilapidated farms and homes, as they were on the bloody fields of the south in beating down and subduing the mad hosts of treason, are, since the white robes of peace have been spread over the land, slowly but surely regaining their former prosperity.

The Southwest Pacific railroad will run through the county, touching Marshfield, the county seat. It will be completed to this place in two years, and the despots, time and space, will no longer cramp our resources; but in a few years we will pour our stores of golden fruit and healthful, exhilarating wines into the lap of St. Louis, the metropolis of the west. Our fertile hills will no longer be clothed in the unshaped but majestic habiliments of nature, but the apple, peach, pear and the grape will draw sustenance from their bosoms.

I am, most respectfully,

Your obedient servant,

B. J. BODENHAMER.

SOUTHEAST MISSOURI,

Embracing within its southern limits the counties of Mississippi, New Madrid, Pemiscot, Dunklin and Stoddard, is entitled to a more extended notice, especially as regards these counties, than it has hitherto obtained. Other sections of our great state, north, center and southwest, have had their agricultural, mineral and manufacturing qualities extensively presented to the public eye by articles industriously circulated in the daily press of the country, as well as in the less public form of pamphlet and book publication. In this respect southeast Missouri proper has been altogether remiss, and her citizens have, as it were, kept to themselves the knowledge of the natural resources of their country. The Iron mountain region, that miracle of mines which contravenes all previous quotations of mineralogy, and scorning the bowels of the land, where alone gold and that more valuable metal, iron, were previously, in all the world's history, embedded, has needed little or no notice, even from the art of printing, to arrest the attention of men of all pursuits and of all nations; its giant form and countless value are a standing advertisement on the page of the footstool set up by a higher finger than that of the compositor. But even the pineries of the southeast, as rich and extensive as those of Wisconsin, are nearly all unknown. Vague surmises are floating around that the southeast is conscious of an inferiority in agricultural resources especially, or her citizens would have developed them in print more largely. It is time for this remissness to wake up, that the truth may be extensively published and put into the hands of emigrants to the west, in order to inform them that the above mentioned counties in southeast Missouri offer advantages to settlers surpassed in many instances by no other section in the western country, and, in some other, superior to any. In no other portion of the valley of the Mississippi are the agricultural products of both north and south raised equally and in equal abundance. In Mississippi county, for instance, opposite the mouth of the Ohio and the city of Cairo, and which has a frontage of sixty miles on the Mississippi river, an acre well cultivated produces its hundred bushels of corn, not as the exception but as the rule, and large farms, ordinarily cared for, average sixty bushels to the acre; while in Dunklin county, for example, cotton, which has been extensively planted during the years 1864, 1865 and 1866, has proved a valuable crop, and farmers gather 2000 pounds to the acre. Wheat and oats grow as well on the prairies in this section as in Illinois or Wisconsin, and garden vegetables attain a size that would be deemed fabulous in the hills or under a more northern clime. Timothy and other grasses grow luxuriantly, producing three and four tons to the acre, and sorghum or Chinese sugar cane seems to have found a natural home there—it flourishes so well and produces so abundantly; so of the produce of the orchard, north and south, the apple and the yam, plums, cherries, strawberries, sweet potatoes, turnips, onions, pumpkins, squashes, melons and the leguminous vegetables which grow luxuriantly and demand but little care to make large crops. During the year 1866 large quantities of castor beans were raised, and they are now considered one of the most profitable crops of this section. Stoddard county produces cotton, tobacco and corn in great abundance. In all this section stock of every kind need no wintering. In 1859 New Madrid county shipped 800,000 sacks of corn.

There are 100,000 acres of land in New Madrid county, at present, for sale at a dollar per acre, and Pemiscot, Dunklin and Stoddard have large quantities for sale.

Let us now calculate a little: A single hand can cultivate 12 acres of cotton and 5 acres of corn; cotton at 7 cents a pound, and a thousand pounds only an acre, will produce $70, and corn at 60 cents per bushel and 60 bushels per acre will give $36; so that the labor of one hand on 12 acres of cotton and 5 acres of corn yields the farmer the gross receipt of $1020; and this at an estimate of the cotton crop less in quantity and price than they actually are, and of the corn crop at its minimum value. Nor is the produce of these counties shut out even now from market. The highway of the Mississippi is within easy distance, by which every production of the soil destined for sale finds a speedy transit.

As a general thing, the country is level and heavily timbered, the soil is black sand and loamy, the timber is first rate—as good as there is in the world. Black walnut is found in such quantities that many farms are fenced with rails made of it; other farms are fenced with sassafras, which grows from three to five feet in diameter. There are immense groves of cypress upon the water courses—a timber equal to pine for building purposes, and superior to it for outdoor work, such as weatherboarding, shingles and fencing. Cottonwood predominates on the Mississippi river and several miles back, which grows rapidly, is of large size, splits freely, and is thus valuable for rails and steamboat wood. Intermixed with the cottonwood, and reaching through Mississippi county, are elm, hackberry, catalpa, honey locust, black locust, walnut, all the varieties of oak, sugartree, maple, hickory, coffee nut, linn or basswood, persimmon, pecan, mulberry, box elder, sweet and black gum, dogwood, pawpaw, redbud, spicewood and other varieties. Grapes grow in the woods naturally, the vines being a foot in diameter.

The streams which belong to this section are the St. Francois river on the west, and White river, Castor river, James' bayou and Bayou St. John, running through the center of the above named counties.

There is a cotton gin at Charleston and one at Bertrand, in Mississippi county. Both of them have plenty of business. In these several counties there are altogether about 40 gins. Before the war there were none. Owing to the absence of cotton culture in the south during that unhappy period, it was undertaken for the first time in southeast Missouri, and its success has exceeded all expectations.

Southeast Missouri, besides her natural advantages of soil, climate and transportation, is on the eve of having them incalculably enhanced by the extension of the Iron mountain railroad south, and the junction therewith, and with each other, of the Cairo & Fulton and the southeast Missouri railroads. In a word, the grand project of an uninterrupted communication from north to south, all the year round, from St. Paul to New Orleans, by railroad, is a fact about to be witnessed in a brief period of time. The North Missouri road is hastening north to link itself in iron bands with the Iowa lines as they hasten on to tie themselves to Minnesota. The Iron mountain railroad, on the other hand, is preparing herself, under contract, to run to Belmont, in Mississippi county, opposite Columbus, the northern terminus of the great network of southern roads. The impetus which will quicken every section and locality of the grand line when completed is incalculable. It will weld the Union sentiment more freely and firmly than legislation. Southeast Missouri will reap her share of these great results. Happily situated in the very center of the grand line, she can exchange her products with either north or south, as her interest determines, and the immigration which soonest settles on her rich lands will the earliest reap the rewards of a wise choice.

HENRY J. DEAL.

INDUSTRIAL UNIVERSITY.

BY JOHN H. TICE.

The tremendous struggle for the maintenance of the Union just closed, has demonstrated that the American republic is the first military power of the world. The powers of Europe looked with amazement and awe upon the gigantic military array evoked by the necessities of the nation, and the seemingly exhaustless resources displayed to maintain, for years, the largest army that authentic history records. The moral effect upon the supercilious powers of England and France is plainly visible, and they treat the American government with much more deference and respect than was their wont. As far as military prestige is concerned, the Americans have nothing more to desire; their cup is full to overflowing. But the American idea of national greatness and glory is not to dominate in the affairs of the world by military but by industrial prowess. To be a military power is well, because it secures the nation from external danger; but to be an industrial power is better, because it secures the greater prosperity and happiness at home. Life, liberty and the pursuit of happiness were declared by the fathers of the republic to be among the inalienable rights of man, and to secure which governments were established among men. To build up a military power was foreign to their design, and did not enter into their conception of a nation. Government, according to their idea, was a necessity to protect life, insure liberty, secure to industry its reward, and assure to the people the greatest happiness their earthly condition is susceptible of. To assure which governments must have sufficient power to maintain internal tranquility as well as repel external aggression. To prevent the nation from being assaulted from without, arming was necessary. Hence in peace it prepared for war, but even in war never forgot to cultivate the arts of peace. True to its mission, the nation, in 1862, though involved in the most gigantic war the world ever saw, through its representatives made the largest appropriation any nation ever did to aid, foster and cultivate the arts of peace—about ten million acres of land, valued at twelve million five hundred thousand dollars, to establish colleges for teaching scientifically agriculture and the mechanic arts.

Europe has a written authentic history reaching back fully two thousand years, and some sections of it more than that. Modern civilization within that time has had its origin and development. History shows it to have been a plant of slow growth. This is not to be wondered at, when we look at the material composing history. It is the record of the bloody acts of princes, their baseness, tyranny, op-

pression, faithlessness, ravages and devastation, not of the trials, sorrows, sufferings, hopes and fears of the toiling masses; or, if incidentally so, how such aspirations were crushed by the strong arm of irresponsible power. It shows that all was done to repress progress and civilization, and nothing for its growth. Civilization, nevertheless, grew by virtue of an inherent, irrepressible power, until it has reached its present status. The laborer, husbandman and artisan were serfs and slaves. In the progress of civilization, it touched their fetters and they fell from their limbs. Some nations liberated from humanity, but others only from policy. Population was increasing, but there was not a corresponding increase in the necessaries of life. Slavery, it was seen, took away every incentive to industry, and labor became only the performance of an enforced drudgery. It was supposed that freedom might inspire a desire for improvement in condition, elevation in social standing, and an ambition to excel in the various industrial pursuits, and thus make labor more productive. Hence the serfs, in many places, were liberated from policy. Though prompted by sordid motives, it was a great step in the progress of humanity, and in a measure productive of the results anticipated. But everything expected from it was not realized. The laborer toiled harder and earlier and later, but the products of his industry kept not pace with the demands and wants of an increasing population. Centuries passed on, and though the material condition of the laborer was improved, his bodily strength was more overtasked than in his former condition. Again the ruling class deemed it necessary that something should be done for him to increase production. Though a freeman, he had been debarred from the privileges of an education. Intelligence was wanted to guide and direct the operations of the husbandman, and it was determined to give him the privileges of a common school education. This was another great step in the progress of civilization. It soon became evident that labor, guided by intelligence, was more effective and productive than when conducted, however diligently, under the disadvantages of ignorance. From time immemorial there had been schools for teaching theology, law and medicine, and later those of art and architecture had been added. Why, then, should there not be schools for teaching the art of the greatest of all human occupations—agriculture? Ah! sure enough, why not? How did it come that nobody thought of it before, and propounded the question? The agriculturist has a task to perform involving the most complicated relations. He has a helpmate—nature—without which he can do nothing. He may prepare the soil, and commit the seed to the earth, but he cannot give the increase. All he can do is to supply the proper conditions; but what are the best conditions? He asks his helpmate. Nature is silent, but she points to the earth, to the air, to the sun, to the heavens. These, then, must contain the secrets which it is necessary to know to be a successful cultivator of the soil. But none can fathom the mysteries of nature, and comprehend, much less appre-

hend, the ultimate laws by which she operates. Science, however, has wrung from her a part of her secrets, and grasped some of the proximate laws that govern in the universe. These constitute the sum total of our knowledge of nature, and must be known to all successful co-workers with her. Why, then, has the scientific training of the agriculturist been so long neglected?

Such considerations and questions as these have agitated the German mind for more than three-fourths of a century. They successively occupied the thoughts of Thaer, Schwertz, Fellenberg, Liebig, and others of the past and present generation. They have taken a practical shape and embodied themselves in educational institutions, some of which are more than half a century old. One hundred years ago Germany had no surplus of agricultural products, excepting wine for export. Now, with nearly four times the population she then had, she exports largely, especially in horses and cattle. She has twenty-seven public agricultural universities, colleges, institutes, academies, and about seventy agricultural stations, where either theoretical or practical instruction, or both, are given a part of the year. Besides these, there are ninety-nine private agricultural institutes and schools. The effect of these institutions is visible everywhere in Germany, in the great care with which every square foot of soil is cultivated, in the economizing of everything and rendering it useful and serviceable, and in the extraordinary productiveness of the soil as compared with former times.

The people of America possess a virgin soil of almost inexhaustible fertility, and a climate favorable for the production of everything of necessity or luxury indigenous to the temperate zone, extending down to sub-tropical regions. In one section of the Union the unpaid, enforced labor of an ignorant servile class was impoverishing the land, and production was only kept up by continually shifting to new soil. In other portions the title of the soil was in him who held the plow; and, though the most laborious of all human occupations, agriculture was the least remunerative of any. Agriculturists and their sons were abandoning their accustomed avocation, and seeking competency and fortunes in easier and more remunerative pursuits. Other professions became crowded, the necessaries of life became dearer, and it became evident here as elsewhere that the permanent prosperity of nations depends upon their agricultural resources and productions. The invention of labor-saving machinery came to the relief of agriculturists, materially lessening both labor and expense, and proportionally increasing their profits. Their pursuit tasking their muscles less, gave them leisure to use their brains more. They began to think, to reflect, and to compare their occupation with that of other occupations. They discovered that the successful banker had mastered the laws of finance, the merchant those of both internal and external commerce, the manufacturer those of supply and demand, and so on through all the grades of professional life. Each was fa-

miliar with the laws governing and affecting his special pursuit, and could, with almost unerring certainty, calculate results. But with the farmer it was far otherwise. Were there laws that governed in his profession, and insured success with unerring certainty, also, when he calculated their force and provided for their operations? He was forced to answer affirmatively. What were those laws? was his next inquiry. The answer was plain: the self-executing laws that govern in the generation, production and growth of vegetable and animal life. What is known of these laws? Why, whatever chemistry, natural philosophy, physiology, botany, mineralogy, meteorology, geology, and other branches of natural science have taught and are teaching. Thus, step by step, the American mind was led to grapple with the same problem, and labor for its solution, as the German mind had a hundred years before. With this difference, however: in Germany they were the men of science, in no way connected with agriculture, but in America they were the agriculturists themselves. The difference, however, is immaterial, since they both arrived at the same conclusion, namely: the necessity of educating the agriculturists, and not only teaching them all that is known of natural science, but giving a special development of each branch of natural science in relation to agricultural operations. To do this, special colleges were needed, just as special colleges are needed for teaching theology, medicine, law, finance, engineering, art, etc.

To establish these schools, two things were necessary: First, an enlightened public opinion to appreciate professional agricultural education; and, second, funds. To insure the first, a series of lectures were annually delivered at agricultural fairs, to impress on the minds of the farmers the importance of applying science to agricultural operations, and of demonstrating the practicability and utility of doing so. The result was a general awakening. The people began to think and to examine. The more they thought and the more they investigated, the clearer and stronger became their convictions of the necessity of special education, and special training in the agricultural art. The agricultural press sprung up, and owes its existence to this newly developed desire for knowledge in that department of industry. The impetus thus given moved on, increasing in volume and momentum, until it demanded special education as a right of labor. To supply this demand, several of the literary colleges instituted a course of agricultural lectures as a part of their curriculum. These, however, were a failure, because there were not, among the college students, enough to appreciate them; and it was impossible for farmers' sons to avail themselves of their benefits without taking the literary course of the college. The movement then took another form, as all other movements for special education had before—that of independent schools for special professional teaching and training.

A third of a century has elapsed since the idea of agricultural schools or colleges was first asserted in America. The first movement,

as far as we know, toward affecting that object was a convention, held at Harrisburg, Pennsylvania, on the 21st of January, 1851, where a committee was appointed to memorialize the legislature for a charter of an agricultural school. In March, 1853, a convention of the friends of agriculture met at Harrisburg, for the purpose "to adopt measures for the establishment of an agricultural institution, to be styled the farmers' high school of Pennsylvania, with a model farm attached thereto." The convention appointed a committee "to prepare the necessary bill to be passed into a law;" and in April, 1854, the legislature passed the bill so prepared, entitled "an act to incorporate the farmers' high school of Pennsylvania." In September, 1855, the trustees accepted the donation of two hundred acres of land offered by General James Irwin, of Centre county, buying two hundred additional acres adjoining for the farm. Upon these the school (since the agricultural college of Pennsylvania) was located. In 1856 the construction of the college building was commenced, the state having appropriated fifty thousand dollars toward erecting same, upon condition that a similar sum be obtained from other sources. In February, 1859, the college was opened for the reception of students, and one hundred and nineteen were enrolled. As this is the first agricultural college established in the Union, though not the first in operation, we have sketched a history of its origin.

The late Judge Buell, of New York, as early as 1838, plead for a special agricultural education. In September, 1839 (a short time before his death), in an address delivered before the agricultural and horticultural society of New Haven, Connecticut, after adverting to the fact that we have schools for studying the sciences of medicine, law, engineering and war, yet for agriculture, by which, under the blessing of Providence, we virtually live, and move, and have our being, and which truly embraces a wider range of useful science than either law, medicine, navigation or war, we have no means of professional education at all. He then proceeds to point out the evil consequences of this absence of agricultural schools, in which to teach the principles and practice of agriculture, and urges upon farmers the necessity of having them established, and closes his appeal with the prophetic declaration, that "many who now hear me will live to see professional schools established in our land, to see their utility extolled, and to consider them the best nurseries of republican virtues, and the surest guarantee for the perpetuation of our liberties. They should be established, and they will be established, and the sooner they are established the better for our country."

In New York repeated efforts were made to induce legislative action, but without effect, until 1853, when a bill was passed incorporating the New York agricultural college, but providing no means for founding it. In 1855 a private subscription was opened, and the legislature loaned the college $40,000 for twenty years, without interest, provided a like sum was raised by private subscription, for purchasing

a farm and erecting of college buildings, etc. A farm of seven hundred acres, between the village of Ovid and the eastern shore of Seneca lake, was secured, a large building laid out and partly finished, and on December 1, 1860, the college was opened. During the rebellion the college was closed, and we believe has not been reopened. In 1853 the people's college was also chartered, designed to be partly agricultural and partly literary in its character. It has been located in Schuyler county, on a tract of two hundred acres; the buildings partly completed, but as far as we are advised has never been opened for the admission of students.

By the constitution of the state of Michigan, adopted in 1850, provision is made for establishing an agricultural college. In 1855 the legislature appropriated fifty thousand dollars for the object. A tract of seven hundred acres was purchased with this, and the buildings erected for the agricultural college. In 1857 the legislature appropriated an additional forty thousand dollars to the college, and in May, 1858, it was opened for the admission of students. After continuing several years, it suspended operations. It has since been revived, and the agricultural university of Michigan is the most famous and successful institution of the kind in the Union. Michigan, therefore, has the honor of putting in operation the first agricultural college in America.

In Iowa, the legislature, in 1858, incorporated the board of trustees of the Iowa state agricultural college and farm, and a liberal appropriation made for the same. In 1859 the college was located in Story county, on six hundred and forty-eight acres of land purchased for a farm. Buildings were commenced, but owing to the disturbed condition, not much progress was made until 1865, when the work was earnestly commenced. The college building in process of erection will cost about one hundred thousand dollars; will be completed sometime in 1867, and the college opened.

In Minnesota a state agricultural college was incorporated in 1858, and located on a farm, containing half a section, in Glen county. What progress has been made toward opening the college we are not informed.

In Illinois the subject of an agricultural college was early agitated, and as early as 1852 the legislature was memorialized on the subject, and kept before the legislature ever since without securing favorable action. Private enterprise, however, succeeded in establishing an agricultural school near Chicago, sometime in 1860. What its fate has been is unknown to us.

In Ohio, as in Illinois, the subject, after long agitation, was early brought before the legislature, and with like unfavorable results. A farmers' college, on a few acres of land near Cincinnati, was established by private enterprise, but we believe has since been converted into a literary institution.

In 1850 the legislature of Massachusetts appointed a committee to

investigate the subject of agricultural education. In 1856 it incorporated the agricultural school, but nothing was done toward founding it until subsequent to the passage of the land donation grant by congress.

The Maryland agricultural college was incorporated in 1856. It is located on a farm of four hundred acres, ten miles north of Washington City. The act of incorporation appropriated six thousand dollars annually for the support of the college, provided fifty thousand dollars be first raised and paid in on private subscription. The buildings were partly completed, and in 1860 was opened for the reception of students, and has been in successful operation ever since.

We have no data at command to show what was done in other states at this early day, that is, prior to the land grant of 1862. The above is, however, sufficient for our purpose; it shows the origin of the movement that eventuated in the passage of the act of congress of July 5, 1862, and the shape that it had assumed prior to that time. It shows that congress acted under the impulse and influence of the men who had originated this special educational movement in the states and controlled it there.

What were the conclusions these men had arrived at about these institutions for special education? Was it to establish agricultural chairs or agricultural departments in literary colleges or universities? Let their acts in the history we have sketched answer. Universally the movement was for segregation from literary institutions as such, and for independent institutions, where science and literature were only to be taught as subordinate to the special object of agriculture. As we have already stated, the impulse for the congressional action was given by agriculturists, who sought a more liberal education for their professions, and who sent committees to Washington City to urge action upon congress. These committees were successful in 1862, after years of labor, amid discouragement and disappointment. The efforts of the committee appointed by the board of trustees of the Pennsylvania agricultural college is especially notable. Embarrassed to meet the current expenses of their college, for want of sufficient endowment, it appointed a committee of its members, one of whom was a member of congress, to solicit the general government to make a land grant to the states for establishing "colleges for teaching agriculture and the mechanic arts." This committee, for several years, spent considerable time in Washington to accomplish its mission, and when finally the effort, after years of disappointment, was crowned with success, aided as it was, by a general movement of agriculturists throughout the free states, the Pennsylvania delegation returned home to find that every college in the state was trying to clutch the prize won after years of arduous toil, anxiety and expense. How the late lamented Dr. Pugh, then president of the Pennsylvania agricultural college, had to fight these cormorants, we will give in his own words by and by.

The foregoing must suffice as to the object of congress, and as a sufficient answer to the sophistries put forward by the starveling colleges and universities in the land, who are seeking to engorge this sacred fund.

We, then, have no hesitation in asserting that the plain, palpable intention of congress, from the history of the matter legislated upon, and from the title of the act itself, is to aid in establishing industrial schools and colleges for special instruction in the various industrial professions; and we go further, and make the assertion that good faith requires that the states should so legislate as to carry out the letter and spirit of that legislation developed in its history and written upon its face. Believing this position to be impregnable, we might here rest the whole argument, but we are not afraid to take up and discuss the question of policy.

That the agriculturists are at the bottom of this whole movement of industrial education, cannot be denied. It is then to be presumed that they surveyed the whole ground before they took the position where they now stand. Why is there this great and extraordinary unanimity for independent, special schools? We might answer: It is for the same reason that theologians have demanded theological seminaries; lawyers, law schools; doctors, medical colleges; teachers, normal schools, etc.; each one a school devoted to teaching its special branch or profession. And why all these? Simply because it was found impracticable, if not impossible, to give the special education demanded without changing the character or impairing the efficiency of the literary institutions. Some of the colleges affect great indignation at what they consider the contumelious treatment received from the agriculturists, in demanding no connection between them and the agricultural college. Why have they not felt the same indignation and manifested the same resentment when the law, divinity and medical schools cut loose from them? Was, and is that not just as contumelious? They know, and everybody knows, that it was not to bring the literary colleges into reproach, but to leave them free within their own proper spheres to fulfill their mission with increased usefulness. Let us hear no more of this supposed contumely from the agriculturists.

It must be evident to everybody that farmers have the same reasons for demanding separate schools for teaching the professional part of their calling as others have. Have they no others? We would rather not answer. But as the colleges, by their conduct, have forced this discussion on us, we will not shirk from it, nor mince the matter.

American society, republican as it is, has not yet emancipated itself from the thrall of aristocratic influence and despotism. Moreover, it worships more devoutly at the shrine of mammon than does aristocratic society in the old world. Sham, and not substance, is its idol. There are callings that are conventionally regarded as respectable; and there are callings regarded as not so. Among those of the

former are law, theology, medicine, etc. Students of these professions could then pursue their professional studies in any literary college without being annoyed by the gibes, jeers and taunts of their associates. But how would it be with the farmer's boy studying to be a farmer—learning how to breed cattle, raise cabbage and compound manures? We do not say that all, nor even a majority, of the students would feel disposed to annoy the farmers' boys. There are sensible boys to be found in colleges, as well as elsewhere, who would not feel themselves degraded, but honored, by the association. But in all colleges there are many brainless snobs, who, as the brainless do everywhere, make more noise, raise more disturbances and generally do more to give character to the institutions with which they are connected, than ten times their number of sensible boys would. These would have all the prejudices and dislikes such people generally have toward the industrious classes, without sense and discretion enough to hide their feelings. The annoyances of this class would soon make the college anything but pleasant, agreeable and profitable to the farmers' boys. For this reason, if for no other, the literary colleges would be avoided by the farmers' boys.

What does experience teach in this matter? Prof. Johnson, author of Agricultural Chemistry, etc., in a discussion before the board of agriculture of Massachusetts, when the proposition of giving the agricultural fund to Harvard university (a proposition which, to the honor of Harvard be it said, she promptly declined), stated that Yale college, some years before, had established a course of lectures on agriculture, and after trying the experiment was forced to abandon it, because there were not enough of the students of Yale that cared anything about the art and science of agriculture; and farmers' boys would not attend.

Connected with the university of Jena, in Germany, is an agricultural institute, which is an integral part of the university. The agricultural students are matriculated as the other students are, and thereby attain all the rights and privileges, and also assume all the responsibilities of academical students, the same as in any other department of the university. As far as theoretic instruction is concerned, there are every appliances, together with the museums and cabinets of the university. But no farm nor garden is connected with it. To compensate for this, the students make an occasional excursion to Zwaetzen, but a short distance off, where there is a practical farming school for the sons of the peasants; where, on the public domain, embracing about fourteen hundred acres, there are numerous herds of cattle, infirmaries for sick animals, distillery, brewery, silk raising establishment, farm, botanical garden, etc., all attended to by the sons of peasants. The object of the institution at Jena is to make farmers, political economists and financiers. The institution is essentially an aristocratic one; and is attended only by sons of the nobility, or of the wealthy and aristocratic classes. At Poppelsdorf,

connected with the university of Bonn, is another agricultural college. The students, on entrance, are matriculated as members of the university, as at Jena. A small farm of about seventy acres is connected with it, supplied with all the facilities for practical illustration. The object of the institution is "for the education of those who desire to become skillful farmers, and for those who attend to the studies of the university, at the same time, to become familiar with the operations of agriculture." As might be expected, none but the wealthy and aristocratic attend it. Similarly is the academy at Eldena connected with the university at Greifswald. "No students are admitted who have not graduated at a gymnasium or polytechnic school, and who are not qualified to enter the university proper." At Gissen, Göttingen and Halle, agricultural departments are connected with the universities, differing not materially from those at Jena, Bonn and Greifswald, and are exclusively aristocratic in their tendency and operations. Experience, then, seems to demonstrate that, even if the connection of an agricultural with a literary college were practicable, the result would be for the exclusive benefit of the wealthy classes, and practically barring the door against the masses. In Europe, the agricultural schools are of two kinds: those connected directly or indirectly with universities, and those which are independent of other institutions. We have seen that experience teaches that those connected with universities become schools for the aristocracy; now let us see what it teaches about the independent schools.

Mr. Flint, the secretary of the board of agriculture of Massachusetts, who visited, we believe in 1863, most of the agricultural colleges of Europe, and who at first advocated the connection of the agricultural college of Massachusetts with Harvard university, says of the agricultural college at Hohenheim: "It is now generally admitted, and I think with justice, to stand at the head of the institutions for agricultural education in Europe."* The college consists of three separate departments or schools—namely, the higher institution or academy, the agricultural school, and the horticultural school. The object of the academy is to instruct those "who desire to obtain a knowledge of agriculture in all its branches and relations, so that they may manage their own estates, or undertake the management of large estates for others." The object of the agricultural school is "to teach young men, who own small estates, how to perform every necessary agricultural operation with their own hands, or to prepare them as "thoroughly practical stewards or overseers of small estates, who will take the plow in their own hands." The object of the horticultural school is "to complete both the practical and theoretical education in gardening and horticulture, which the students have received in the other schools" (that is, polytechnic schools); and the requisites to enter it are "to be seventeen years of age, and to have served three years apprenticeship in gardening or in the vineyard."

* We quote from a pamphlet before us, not having seen Mr. Flint's report.

In addition to these three schools, into which the agricultural college at Hohenheim is divided, there are also annually given extraordinary courses, continuing from four to six weeks, at the proper season of the year, for practical application, such as a course on fruit growing, on meadow culture and management, on shepherding, and on school teaching. The course on fruit growing includes practice in grafting and budding. The course is five weeks in spring and one in summer. These extraordinary courses are intended for those who have neither the time nor means to spare to attend the general courses at the college. Bee management and silk culture, etc., have also extra courses assigned them. Mr. Klippart, the secretary of the Ohio state board of agriculture, who in 1865 visited it, says: "Hohenheim is not only the oldest, but the most famous institution of this kind now in existence."

As already stated, there are in Europe two kinds of agricultural colleges, namely: those connected with universities, and those independent of universities or other literary institutions. In the former, scientific and theoretic agriculture only is taught; in the latter, scientific and theoretic instruction is combined with practice. The latter institutions are also more or less polytechnic schools of the higher order, where most of the industrial arts are taught, such as spinning, weaving, distilling, brewing, fulling, dyeing, pottering, silk raising, mechanism, etc. The advocates of the university schools are the nobility and aristocracy; those of the independent schools, the industrial classes. This gives rise to two parties, which are represented at the fairs in Germany, and between whom party spirit runs high, and between whom there is an arduous contest for the best exhibition. The word farmer or agriculturist is not known; hence those of one party are called "landwirth" or "gutsbezitzer:" Landwirth, a country landlord, and gutsbezitzer, lord of a manor—proprietor of an estate. The other party is called polytechnickers, i. e., polytechnists, or graduates of a polytechnic school. The former are the owners of large estates ranging from 1,000 to 3,000 and more acres; the latter are small proprietors, owning generally small quantities of land, down to one acre and less. The landwirth is either already a nobleman, or he may purchase a patent of nobility. He is ex-officio a member of the village council, may be elected to the national house of representatives, and may carry on brewing, distilling, or any other of the polytechnic arts on his estate. The polytechnicker cannot purchase a patent of nobility, nor can he change his occupation. They are emphatically what our southern aristocrats called the industrial classes of the north—the "mudsills." The polytechnicker call themselves "democrats," and denounce the gutsbezitzers as "aristocrats." When, therefore, we find two kinds of industrial schools in Germany, one connected with universities, and the other independent, we understand that the former are for the aristocrats; the latter for the democrats. In establishing our industrial schools, we must therefore keep in view for

whom we intend them. If for the aristocrats, connect them with the universities or colleges; if for the masses, the democrats (I use the word in the philosophic sense), then make them independent. This will be the result, whether we intend it or not, so long as effect follows cause.

Mr. Klippart describes the landwirths (we regret he did not also describe the polytechnickers) as follows:

"The landwirth of the modern school is a highly educated gentleman, courteous, polite in his manner, very companionable indeed; many of them graduates of agricultural colleges. All that I met were deeply interested in agricultural education, experimental farms, etc.; in fact, any of these graduates, I think, are eminently capable of taking hold of an agricultural college and running it, with proper assistance. I know for myself, I would not hesitate a moment to vote for any one of them to be president of our Ohio agricultural college."

In America, one of the brightest pioneers of industrial education was the late Dr. Evan Pugh, first president of the Pennsylvania agricultural college. Opening one of the first institutions of the kind, which was the offspring of the enterprise, intelligence and liberality of the farmers of Pennsylvania, he had to encounter all the difficulties of a new enterprise and incur the risk of failure and disappointment incident to untried experiments. But thoroughly prepared for the task, both by natural endowments and education, and moreover impressed with the magnitude of the cause and an unshaken confidence in its ultimate triumph, he proved himself more than equal to the undertaking. No one had given the subject more anxious thought, nor investigated it with more searching scrutiny. Taking into consideration all that had been done, and all that was proposed to be done by the literary institutions for the education of the agricultural classes, and the results attained where the experiment was attempted by them, he became convinced of the impracticability of seeking the object in that direction, and that it was only to be attained by special colleges for the purpose. Speaking of the great Albrecht D. Thaer, who, in 1770, being then a student at the university of Göttingen, attended the lectures of Prof. Walther on agriculture, in that institution, he says: "He saw enough of the disadvantages of attempting an agricultural education in an old conservative institution, with sterotyped habits, to satisfy him that a course of instruction so radically different from that of the university, as that of scientific and practical agriculture must be, and could only be carried out properly in a new order of institutions especially adapted to agricultural science and practice."

He deemed it not only impracticable to attempt giving a thorough scientific industrial education in the literary colleges, but he regarded them as unfriendly to the object, as far as educating the masses was concerned. Here is what he says:

"This land grant was the result of the growing intelligence of the agricultural classes of the country, and the modern devolopment of

all those sciences which have a practical bearing upon the industrial operations of life. A necessity for industrial colleges was felt throughout the entire country. Literary colleges not only failed to supply an education especially adapted to the peculiar necessities of the industrial classes, but through their highest officials they persistently proclaimed that no such special college education was requisite, and that the best education a young man could have to fit him for practical duties in life, was to be found in the study of Greek and Latin. The idea of industrial education was turned into ridicule, and industrial colleges were denominated visionary ideals of impractical men.

"Determined that means should be provided for a general system of industrial education, a few prominent friends of such a system of education from other states, in conjunction with the friends of the agricultural college of Pennsylvania, after six years of persistent effort, secured the passage, by congress, of the land grant bill. This bill afforded sufficient land or land scrip to each of the larger states to enable them, with a reasonable effort from the state, to found one agricultural college. Smaller states could only use it by establishing agricultural chairs in literary colleges, as they had not enough to endow an industrial college. The object of the bill, however, was most distinctly not simply to found industrial chairs in literary colleges, but to endow industrial colleges."

Upon the attempt to pervert the intention of this fund, he makes the following remarks:

"No sooner was the bill passed, than in some states the representatives of several literary colleges, with singular bad taste, made a general rush to the state legislature to secure a portion of the proceeds of the bill, and in the general scramble for a share of the spoils, in some instances, defeated all legislation upon the subject. That literary institutions should, with such undignified haste, grasp at resources (secured for the endowment of industrial colleges) to which they had not the slightest legitimate claim, is a melancholy illustration of the terrible extremities to which they are driven in the struggle for existence. It should warn those states which would found industrial colleges to endow them properly, and not cast them into the world to struggle in poverty for existence, guided by a necessity which knows no law and recognizes no right.

"What are the claims of these literary colleges upon the land grant fund? Can they afford the kind of education required in an industrial college? Can they organize the four or five different courses of study required to meet the peculiar necessities of industrial education? Can they, with their half dozen professors, do the work which fourteen first class scientific men are required to do, in addition to teaching all their literary studies? No! They would only degrade industrial education to the standard upon which they have heretofore looked with merited contempt. Suppose, for illustration, that Ohio were to allow this land scrip fund to be frittered away upon half a

dozen colleges, or even upon two colleges, while Pennsylvania concentrated the same upon one college, does any one doubt which would have the most desirable plan of industrial education—Pennsylvania or Ohio? Would not the ambitious sons of the industrial classes of Ohio despise their own industrial colleges, and come to Pennsylvania, just as students now crowd from all states to make up the 800 students at Harvard university?"

It was our intention to have given extracts from his appeal to the legislature of Pennsylvania against a division of the fund, and assigning one-third of it to Alleghany college at Meadville, which, he says, was the only college of twenty-three in Pennsylvania which had the bad taste and indelicacy of asking the bestowal of a part of the fund secured by the perseverance and indomitable energy of the friends of agricultural education, impelled thereto by the conviction that the desired education could not be furnished by existing literary institutions. As nearly if not quite all the ideas are embodied in the quotations already given, it would be a mere reiteration of the argument to do so. Many considerations which have not yet been touched upon crowd upon us, but which we cannot discuss, and confine this essay within reasonable limits. When the establishment of an agricultural college first came up, we had no idea that such an essay as the present would be necessary, and that the first obstacle in the way was the state university. We desired no conflict with that nor any other literary institution. We thought they had a definite sphere marked out for them, with which industrial colleges, operating in another sphere and having no intention of interfering with them, would not be the objects of their hostility. The friends of industrial education, instead of the pleasing task of collecting the experience had elsewhere, and presenting the details of such institutions in a tangible and intelligible form, so as to secure wise and efficient legislation, had the unpleasant task thrust upon them of fighting the literary colleges to keep them from devouring the fund. If hard blows have been dealt them under which they smart, the fault is their own, for they provoked the controversy. They will, perhaps, learn one thing, though late, that the industrial classes cannot any longer be used as jackals to hunt and run down the prey for lions. We speak only of those institutions who made preposterous claims either to clutch the whole or to share in the division of the fund. A large majority of the literary institutions in the state had the good taste to make no efforts to secure either the whole or a part of the fund, nor to obstruct legislation in reference to it. They saw that the fund was secured by the efforts of those who were impressed with the conviction that a special education was needed, and that it could not be furnished by existing institutions, and that, therefore, schools must be established for this special object. They thought they had just as much right to demand to share in the amount secured by private subscription to start any new college as to demand the agricultural college fund. They recog-

nized the right of the agriculturists to the fund secured by their own exertions, and for a special purpose, and hence, any claim made to it by those who had not moved a finger to procure it was both unjust and impertinent.

The generation that initiated the movement of agricultural education have nearly all passed away. A few still linger among us who, from the top of Pisgah, are permitted to see the promised land, which they are not permitted to enter. They have been through the wilderness, encountered all its trials and difficulties. There is no longer any doubt nor despondency with them. The entrance into the promised land may be deferred, but not prevented. The industrial classes may be deceived by those whom they have trusted, and cheated out of their fund; but industrial colleges are a fixed fact and will come; if not to-day, to-morrow. There is nothing more certain written in the book of fate. Let us, then, take courage, for if defeated, we, like Atæus of Lybia, will arise with new strength and vigor every time we are beaten to the earth.

ADDENDUM.

In the preceding article the record of the establishment of agricultural colleges was brought up to 1862, for the purpose of showing that the act of congress was to aid a movement wide-spread and general in the states, what efforts had been made to attain the object without the aid of the general government, and to clear up any ambiguity, if any existed, respecting the object of the grant. It would have been malapropos to have traced the subsequent legislation then, it not being pertinent to the argument. The matter, however, intrinsically possesses a deep interest to the public, especially to the states that have not definitely acted on the matter. We therefore resume the narrative, adding such facts as have since been developed in regard to the older institutions.

Maine has established its agricultural college at Orono, on a farm. No buildings yet erected. Vermont has created an agricultural department in the university at Burlington. The farm has one hundred and fifty acres. The legislature of Massachusetts, in 1863, incorporated the Massachusetts agricultural college, near Amherst, on the Connecticut river. It has a farm of four hundred acres. Levi Stockbridge, for a long time a member of the state board of agriculture, has recently been appointed farm superintendent—salary $1,500. Some of the farm buildings have been erected. The college buildings are contracted for, and will be erected during the present summer. The faculty of instructors has been appointed and announced, but no time fixed for opening the college. The town of Amherst gives $75,000, and the state $10,000.

Rhode Island has established a chair of agriculture in the scientific department of Brown university, at Providence.

The Sheffield scientific school of Yale college, New Haven, Con-

necticut, received the proceeds of the land grant by act of the legislature, in 1863. The agricultural school is organized, and has one hundred and twenty pupils. A short course is also arranged for the fall and winter months for young farmers who cannot devote the entire year.

The Hon. Ezra Cornell endowed an institution, since called the Cornell university, with $500,000, upon condition that it received the land grant, which was done by the legislature of New York, and the institution located at Ithica, the residence of its munificent founder. The farm consists of three hundred acres, and is valued at $50,000. The first part of the college building, costing $60,000, will be completed by the first of July, 1867, and the agricultural department at once organized; afterward to be followed by the other departments of a full university. One hundred and seventy thousand dollars, already realized from the land grant, together with the endowment, $500,000, have been invested at seven per cent., producing $46,970 per annum. Of the scrip, three hundred thousand acres have been carefully located in valuable lands; besides, Mr. Cornell has purchased scrip for six hundred thousand acres, making nine hundred thousand acres, the net proceeds of which are to swell the endowment. Mr. Cornell has resolved upon making the endowment of funds from all sources, for the university, three millions of dollars, which is to be invested so as to produce an income sufficient for the demands of the university, and make it one of the first, if not the first, institution in the Union. Detached buildings are to be erected for chapel, offices of faculty, dormitories, library, cabinet, observatory, two laboratories, dwellings for professors, head farmer, mechanic, etc.

New Jersey has given her land grant to the Rutgers scientific school of Rutgers college, at New Brunswick. It has a fine farm of two hundred acres, three-quarters of a mile from the college—opened in 1865.

Kentucky has established the Kentucky agricultural college upon Ashland, the former residence of Henry Clay. The farm consists of four hundred and thirty acres. The college has $250,000, raised by subscription, besides the land—three hundred and thirty thousand acres—and is connected with the state university at Lexington.

Illinois has just located its agricultural college at Champaign, the citizens donating $250,000, besides college buildings and a farm to the college.

Minnesota, during the present winter, has established and located its agricultural college on the independent basis. (The memorandum containing the particulars mislaid.)

The Kansas agricultural college is located at Manhattan, on a farm of eighty acres. It has been in operation since 1863, and receives both sexes.

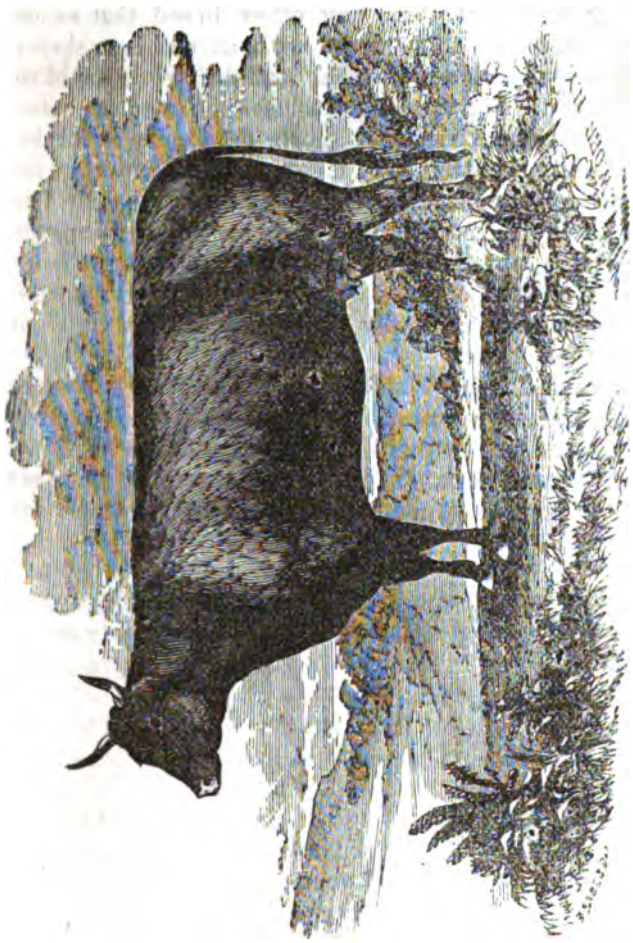
The Pennsylvania agricultural college received an almost irreparable loss in the death of its first president, the late Evan Pugh. It is

also very much embarrassed by debt. It has been recently reorganized by changing many of its faculty, and other improvements, and is now in a promising condition. General Frazer, formerly of Jefferson college, is its new president.

The Michigan agricultural college is in the most flourishing condition, with a corps of excellent, thorough instructors. It has not sufficient accommodations for the pupils applying for admission.

Ohio has recently acted upon the subject, and established an independent college, in the northern part of the state. Locality not remembered.

This completes the actions of states on the subject of agricultural colleges, as far as we are advised. J. H. T.



DEVON COW, INA, OWNED BY N. J. COLMAN, OF ST. LOUIS COUNTY.

Dam, Beck, second, bred by L. G. Collins, late of Indiana, now of Marion county, Missouri. Sire, imported Herod (214. D. H. B.) Dam, Beck, first, by imported Anchises (140.) Sire of Ina, Taurus, bred by Horace Capron, of Illinois. Calved, April, 1858. Dam, Jane (1330.) Sire, Bloomfield (373.)

DEVON CATTLE.

This breed or race of cattle is admirably adapted to Missouri. They are of medium size, dark red color, and possess a very docile disposition. They are a tough, wiry, hardy race, and can withstand more exposure, hardship and neglect than any other breed that we are acquainted with. If cattle are to be kept without stable or shelter except such as the heavens and a worm fence afford, we know of no breed equal to the Devon. For working purposes the oxen are unsurpassed. Being uniformly of a dark red color, similar in size and make, fine travelers, withstanding extremes of either heat or cold, they are all that can be desired by the farmer where cattle are required to assist in the labors of the farm. For the hilly sections of our state they are peculiarly well adapted. They have great capacity to range far and wide in search of food, and the scanty herbage in some portions of the state, where the more lordly Durham would not thrive, is ample sufficiency for the Devon.

As milkers, their record is good. They do not give perhaps quite as much milk as some breeds, but make up in richness whatever they may lack in quantity. And for the quantity of food consumed we do not believe any cattle give more milk. They require less food than any other breed we have. Their neat, compact form shows that there is no unnecessary waste.

PROCEEDINGS

OF THE

MISSOURI HORTICULTURAL SOCIETY.

St. Louis, January 8, 1867.

The eighth annual meeting of this society was held in the supreme court room, President H. T. Mudd in the chair.

The meeting was opened by prayer by the Rev. Charles Peabody, after which the President delivered his annual address, as follows:

With profound reverence and gratitude should we remember how a merciful Providence has preserved us through the past year, and now at the beginning of the new year kindly permits us, surrounded by many familiar faces and highly esteemed friends, to assemble in the eighth annual convention of our society. Not alone from the ordinary ills and casualties of life have we been thus preserved, but His watchful care has been extended over us in protection from the unusual and remarkably fatal sickness which swept over our country during the past summer and autumn. Should not this continued favor greatly encourage and strengthen us in our purpose to work out His further will and pleasure in endeavoring, by the practice of the arts of horticulture, to beautify and adorn those places of this beautiful earth which He has given us for our habitations, and to improvement in the cultivation and production of those fruits which are confided to our care, that we may, by a wise use, make them great blessings to ourselves and to those who are to come after us.

During the past year the cause of horticulture in the west has lost one of its most intelligent and earnest workers in George M. Beeler, late secretary of the Indiana state horticultural society. Though young in years, his zeal, industry and intelligence had made his mark on the horticulture of our sister state, and gave brilliant promise of widely extended influence and usefulness.

Eight years ago, a few persons, recognizing the importance of a state organization "for the purpose of advancing and directing the fruit growing interests of Missouri and the west," met at Jefferson City on the 5th of January, 1859, and formed the Missouri fruit growers association. Organized thus, as it were, on the outposts of western

fruit growing, this association attracted to it the fruit growers of our own state and of the most advanced fruit growing districts of our neighboring state of Illinois, in such numbers and of that progressive and enthusiastic quality as to develop the want of a wider range of purpose, embracing all the objects of horticultural design and improvement. This "advancement" dictated a change of name, which was made in January, 1862, at our third annual meeting, when our association took the name of the state horticultural society. Since this period a portion of our discussions and deliberations has been given to the growth of evergreens, to the protection and planting of native forest trees, to gardening, and to other means of increasing our comforts and adorning our homes. Your labors have accomplished much good, but as yet you have only turned a few first furrows—as it were, only laid out the lands in the great field of horticultural improvement. Where we have accomplished most, we have only demonstrated the feasibility and with it the necessity of still greater progress in those arts which promote civilization and refinement, and augment so materially the wealth and comfort of our people.

Have we not so far almost wholly neglected to encourage and give direction to the planting and care of flowers and ornamental shrubs? Should not measures be taken to save from destruction some of the beautiful flowers which now grow wild in our forests and on our vast prairies? A few years hence we may look for them in vain. The march of the plow, the grazing of herds of stock, may have destroyed many of the most fragrant and lovely. If we would rescue them, is not now the time it should be done?

I will again invite the attention of those who grow fruits for market to the project of establishing, by joint stock company or other association, of a fruit bazaar or exchange, where producer and consumer shall be brought together for exchange of products, fruits, wines, etc., with least possible expense of labor and money.

Owing to the presence of cholera at that period, the biennial meeting of the American pomological society, which was appointed to be held in our city in September last, was postponed until next September. It is expected that the necessary arrangements for the proper accommodation of this convention shall have the attention of our local horticultural associations. To this I would ask your consideration at this meeting.

Since our last meeting I have received for distribution one thousand copies of the agricultural report of Missouri, a volume of near seven hundred pages, embracing transactions of this society for 1865 and 1866. This large volume, containing much that is believed to be useful and interesting to agriculturists and horticulturists, will, on application, be furnished to members of this society who have not heretofore been supplied.

The secretary then read his annual report, as follows:

It is with feelings of pleasure and gratitude that we are able to

greet our society once more assembled for deliberation upon those pleasing objects that have so long united us. The events of the past year have not been remarkably exciting in their character.

The visitation of the pestilence that blighted many a hope and brought many a bitter tear, caused us, as lovers of pomology, to sustain a severe disappointment, to which we bow, and now start forth again, determined that nothing shall be wanting in the coming year to make that great assemblage of friends, the forthcoming meeting of the American pomological society, the success it so well deserves to be.

It may be well to call the attention of the several committees appointed at our last meeting to correct the catalogue of the American pomological society for this state to the fact, that, in our opinion, a misconception exists as to the objects to be attained by the completion of this most elaborate and important work.

The views expressed by the able chairman of the committee on the "revision of catalogue," leads to the opinion that we are not simply to furnish lists of fruits that succeed in this state, but to take up the entire catalogue seriatim, and mark the degree of success attending each variety named therein according to the signs therein expressed, and then add any fruits not named in the catalogues that have been tested in the state. If this is intelligently done in every state, we will have the basis of a grand pomological map of the country, the indications of which will not only exhibit the idiosyncrasies of varieties, but the effects of soil, climate, moisture, elevation, and will become not only a reliable practical guide to planting, but an invaluable scientific aid to the study of the physiology of vegetation, the laws involved in "thermal conditions," and the local causes that modify to so vast an extent scientific generalizations, and will prove a work without any parallel among the pomological researches of other countries, for completeness of design or extent of area, or variety of climate delineated. To our part of the work let us give our full attention.

To another subject, which cannot be too frequently presented to our minds, we again call attention, that of the maintenance of our forests and to the planting of evergreens, with a view at once to furnish a constant supply of timber, afford shelter, modify our climate and beautify our landscapes.

We call the attention of the society to the state of the "wine question."

The views enunciated by your wine committee last year, setting aside, as it did, the conclusions arrived at by the society and deliberately given to the public by special resolution, has given rise to much discussion. The position of this society, as such, should be clearly stated, so as to show the true position of the society upon this point. This subject is not brought up with the idea of trying to interfere with the liberty of individual action in regard to the treatment of their wines, but so that we may either reaffirm the position taken hereto-

fore by the society, or at once say that that high position is found to be practically untenable.

There are a few words to be said in regard to the preparation of last year's report. At the last annual meeting the business committee of the society saw fit to undertake the arrangement of the publication of the proceedings of the society. The constitution of the society provides, and the practice of the society has always accorded with the provision, that it is the duty of the secretary to prepare the proceedings of the society for publication. We notice this fact not so much for the purpose of resenting this action of the "business committee" as a personal insult to the secretary, but because it was an act of discourtesy to the society itself to attempt this; and because it is only when every one knows his duties and carefully performs them that the action of any body of men can be harmonious or effective. The ballot is an easy, honorable and constitutional mode of getting rid of an inefficient or undesirable servant.

This report was, on motion, referred to a committee consisting of Dr. Morse, Dr. Hull and Mr. C. M. Saxton.

The report of the treasurer was then presented, as follows:

JOHN H. TICE, TREASURER, IN ACCOUNT WITH MISSOURI STATE HORTICULTURAL SOCIETY.

Jan. 1, 1866.	For amount of balance on hand	$74 80
12.....	amount received from one hundred and thirty-four members, annual fees of membership	265 00
		$339 80
	CONTRA CR.	
Jan. 13, 1866	By amount paid Quigley (janitor)	$ 15 00
	amount paid H. T. Mudd for sundries	32 65
	amount paid Barler and Allen for reporting proceedings	100 00
	warrant to C. W. Spalding, expenses of Shaw garden committee	10 00
	warrant to Bryan for printing	3 50
Apr. 7, 1866.	Pacific railroad for freight	2 05
	Henry T. Mudd	1 75
	Foster & Cooper, state printers	27 50
	Pacific railroad, freight	16 80
Jan. 1, 1867	balance	130 55
		$339 80
Jan. 1, 1867.	To balance brought down	$130 55

On motion, the report was referred to a committee consisting of Messrs. Clagett, Huggins, and L. D. Votaw.

Mr. Peabody said that there were many members who had no copy of the constitution and by-laws, and thought it desirable that they should be collated and printed; whereupon it was

Resolved, That a committee of three be appointed to collate the constitution and by-laws for publication with the present proceedings.

The President appointed Rev. Charles Peabody, Dr. L. D. Morse and C. M. Saxton.

The following communication was read to the meeting:

ROOMS OF THE MERCANTILE LIBRARY ASSOCIATION,
ST. LOUIS, 8th January, 1867.

Strangers in the city, members of, or in attendance on, the state horticultural society, are invited to visit the rooms of the Mercantile library association, corner of Fifth and Locust streets. The secretary of the society will furnish tickets, or application can be made to the librarian.

It is suggested to home members of the society, who are also members of the library, to recommend for purchase the most desirable horticultural and agricultural books. It is probable that during this season there will be opportunity of increasing our purchases in this line.

GEO. R. ROBINSON, *President.*

Mr. Saxton moved that the thanks of this society be tendered to the Mercantile library association, for their great liberality and kindly feelings, and that their invitation be accepted.

Mr. Robinson remarked that at present the books for the library were mainly selected by purely literary men, who were not as well acquainted with agriculture and horticulture as his friend Mr. Tice, but this would in time be remedied, and he hoped that a committee from this society, who are members of the library association, would be appointed to recommend a list of books.

It was, on motion,

Resolved, That a committee of three be appointed to recommend a list of works on agriculture and horticulture to the Mercantile library association.

The secretary stated that he had very frequently asked the favor of consulting works in the interest of horticulture, and in communications to departments of the general government, asking for information, and he had, in every instance, been treated with the utmost kindness.

The following communication from Mr. Norman J. Colman, a member of the legislature now in session, was then read:

JEFFERSON CITY, 7th January, 1867.

H. T. MUDD, ESQ., *President Missouri Horticultural Society:*

DEAR SIR: I regret that I am compelled to inform you that it will be impossible for me to be present at your meeting, to fill my appointment to address you on the subject of "horticulture in its relation to agriculture." I feared, when you invited me, that it would be out of my power to leave here, and so informed you, but upon your pressing invitation consented to make the effort. I went to work in good faith preparing my address, but now find that I am so trammeled with other

trusts that I cannot desert my post here. This is a source of much more regret to me than it can possibly be to you. You know, I believe, the deep interest I feel in the welfare and prosperity of the Missouri horticultural society.

I came to this city with a few faithful friends to pomology, and assisted in organizing it. Our number was then small; but, behold how it has grown! I think I can safely say it is now hardly second in intelligence, in influence, in numbers, to any state society in the country. It is doing a vast deal of good. It is aiding in bringing before the public the unsurpassed excellence of our fruit lands. It is assisting in bringing to our state a large, intelligent and enterprising population. It is annually disseminating the most valuable information on the subjects of horticulture, among not only the people of our own but of other states. This will be the first meeting of this society that I have failed to attend since its organization. I shall watch for its proceedings with great interest, and know they will be, as they always have been, worthy of such a society.

Allow me to make a few suggestions, as I think, for the good of all. We have heretofore spent much time in adopting lists of the various fruits. And every year we have gone over the same work, repeating, to a great extent, what had been said and done in former sessions. I do not think much of lists adopted by any society. I think they mislead more than they guide.

Quality of soil, exposure, elevation, and other circumstances have much to do with the success of particular varieties, and if planted without regard to these, failure frequently will be the result.

My idea is, to let the lists stand, and not discuss them except on motion to add to or strike from them. You will then have much more time to discuss the best systems of cultivation of the various fruits, the proper method of pruning trees, marketing the fruits, and averting the diseases to which they are subject. These are subjects of deep importance to every fruit grower, and need great consideration.

I hope our members will all feel deeply impressed with the importance of making the most ample display of all kinds of fruits and wine at the meeting of the American pomological society, in St. Louis, in September. It will be a splendid opportunity to show to the world the superiority of all our fruits, and the great adaptability of our soil and climate for fruit and wine culture.

I know our society feels the deepest interest in founding an agricultural college. I have come here, at a great pecuniary sacrifice, to aid in establishing this institution—to prevent any waste or diversion of its fund—to prevent a division of the fund by establishing several institutions instead of one. I hope that pomology and horticulture may receive as much benefit from this institution as agriculture.

They are intimately related and mutually dependent upon one another. A horticultural department is imperatively demanded from our agricultural college fund.

The great difficulty in the way of establishing such an institution as we would like to have is the insufficiency of the fund in our state. We are entitled to three hundred and thirty thousand acres. But this is refused land already. It has not been entered even at a "bit" an acre. So you see we have not such a fund as is needed. I do not think that it will net us fifty cents an acre, nor more, probably, than $150,000. This is wholly inadequate for the support of such an institution. The interest, at six per cent., would give us only nine thousand dollars per annum. Can an institution that will be a credit to the state be sustained on this amount, or even on twice the amount? Would it not lead a sickly, ephemeral existence? The constitution of our state requires that there shall be a department of agriculture in the state university. This is obligatory upon us. Ought these funds to be united in some way? Already over $300,000 have been expended in establishing the state university. A college building has been erected capable of accomodating from six hundred to one thousand students. They have a fine library, extensive philosophical, chemical and astronomical apparatus, a most extensive and valuable geological, mineralogical and botanical cabinet—said to be equal to any in the western country. The institution is in successful operation. Five professors, including the president, having been already employed, and a number of whom would have to be connected with the agricultural college wherever located. In addition to this a handsome farm of from two hundred to three hundred acres of land immediately adjoining the university property, and admirably adapted for the uses of an agricultural college, is proposed to be given by the citizens of Boone county, free of charge to the state, if the agricultural college is connected with the university. In view, then, of the imperative requirements of the constitution, and of the ample expenditures already made and necessary for the success of the agricultural college, would it not be the true policy of the state to connect it with the state university? If this be done, the institution can be put in operation at once, and the prospect would be good of building up an agricultural department which would meet the objects of the congressional grant, and which would in the end be an honor to the state.

It is proper that I should state that my views have undergone a change since surveying the whole ground and taking into consideration the total inadequacy of the fund to support such an institution as we would all like to see sustained. If some philanthropic man like Ezra Cornell would give us half a million of dollars, we could start out alone; but as it is, I fear we would jeopardize everything by so doing. I would like to be with you to talk this matter over. I appreciate the deep interest you feel in everything that relates to the advancement of the noble interests of agriculture and horticulture. I have hastily thrown together these remarks for your consideration; and if a fund can be created sufficient for a self-sustaining agricultural

college, that will be creditable to the state and to the great interests which it represents, I shall be in favor of it.

Very respectfully, your obedient servant,

NORMAN J. COLMAN.

It was, on motion, referred to a special committee.

A letter was read from Mr. William Tanner, Leavenworth City:

LEAVENWORTH, KANSAS, 7th January, 1867.

Missouri State Horticultural Society:

Having received your invitation to attend the meeting of your society on the 8th inst., would offer in reply my thanks for the courtesy extended. I feel that nothing would give me more pleasure than to spend a few days with the members of the society, hearing the discussions and addresses from the most able horticulturists of the west, as well as to have an opportunity of seeing and comparing the winter fruits of your locality with those of our own, three or four hundred miles further west. Circumstances will not admit of my being present on this occasion; but my best wishes are with you, hoping that your meeting will be a success, and that, some day, I will be able to meet with you.

For the last eight years, my time and study has principally been devoted to the nursery and fruit growing business—mostly the latter —at this place. I have obtained all the reliable information I could from fruit growers in this county, also from some in the adjoining counties in Missouri.

The apple appears to be the most successful of all fruits.

We had a fair crop this season—fruit of good quality and large size. The apple that stands highest at this time is one called the "Campbellite," a local name, I believe. By many fruit growers it is thought to be the white winter pearmain. I saw a load sell, a few days ago, very readily for two dollars and twenty-five cents per bushel, while genitans were dull sale at one dollar and twenty-five cents. I have no hesitation in saying that, for all purposes, it stands pre-eminent. Out of sixty varieties that I have in my nursery, there is more call for the "Campbellite" than for any other ten kinds.

Old Mr. Todd (deceased), who had cultivated many varieties of apples in Platte county—for the last twenty years—told me he had made the most money out of the white bellflower (Ortley), but the "Campbellite" he valued much the highest of any apple he ever knew. I find, since the apple is becoming better known, it meets with unreserved praise wherever seen or tasted, and is unhesitatingly pronounced the best in cultivation for this locality. I send the outline of two of the average size specimens. The color is soft, clear yellow, with a slight shade of green, with a warm blush cheek covering one-third of the surface. Stem, medium length, strong, in

a deep basin; calyx closed; seeds, small, light brown, closely imbedded in a small fleshy core; flesh, yellowish tinge, of a sprightly sub-acid spicy flavor, with a very strong pine-apple aroma; season, from December 20 to April 1, during which time it commands the highest market price. It is an early and abundant bearer. Tree, hardy, free grower—forms a handsome upright head with little care or pruning. If I have an opportunity will send you some specimens, with the request that your society will give it a proper name.

Mr. Todd told me that it came from the east with a lot of other trees, but the label was lost, and he never was able to ascertain the name of it, and after finding it so much superior to any other apple, he concluded to call it after his own church—"Campbellite." Now, since its merits are so widely known and it has become so popular, one would think from the demand for the trees that all of Platte county and a part of Kansas had turned Campbellites—at least, so far as the apple is concerned. I have an orchard here of six thousand trees, four thousand apple, two thousand pear and other smaller fruits, planted mostly with a view to the best market varieties. I felt my way carefully, consulted the best fruit growers of the west in regard to varieties. In doing so found different opinions in different localities; found that one's own locality was the safest adviser; also found that the difference of opinion arose mostly from the unsuitableness of particular varieties to all localities. My experience here gives me entire satisfaction and induces me to believe that our country is proving very superior for the cultivation of the apple and grape.

The spirit of horticulture is becoming aroused since our fairs last fall. The people there saw that fruit would grow in Kansas, and many resolved to plant orchards who had not before thought of doing so. We are now about forming a state pomological society. When we get in working order we shall be pleased to exchange reports with you, as well as to offer any of your members our hospitality who would be pleased to visit us. Until then I can only extend an invitation to any of you to call on me, when you come to Leavenworth and have a few hours to spare. Respectfully,

WM. TANNER.

A. S. Redfield has seen and eaten the "Campbellite," and thinks it very good indeed.

The president: From the sketch it is not the white winter pearmain.

The letter was referred for publication.

A letter was read from M. P. Wilder, president of the American pomological society, to Mr. C. M. Saxton and Dr. Edwards, in regard to the meeting of that society in St. Louis on the 11th of September next.

Mr. Saxton stated that during the last season he had seen Mr. Wilder and many of the leading horticulturists in the east. All expressed

feelings of disappointment at not being able to meet last year, and their determination to have a large representation next season.

Dr. Edwards wished a distinct expression of the society on the time and place of this meeting; whereupon it was

Resolved, That we cordially agree with the president of the American pomological society in thinking that the best time for its meeting will be Wednesday, the 11th September, and that the meeting be held in the Mercantile library hall.

The committee on treasurer's accounts reported "having examined said accounts and vouchers and find the same correct."

The president announced that he had been able to make arrangements with all the railroads in this state, and with the St. Louis, Alton and Terre Haute, to return members in attendance on the meeting free, and with the Chicago and Alton at one-fifth fare.

It was resolved that the hours of meeting of the society during this session be nine and a half A. M., two P. M., and seven in the evening.

Rev. Chas Peabody called attention to the fact that since the last meeting a new paper in the interest of agriculture and horticulture had been published in this city by the Messrs. Plant, and having Dr. Morse as editor—The Farmer's Advertiser, and moved that it be placed on the list of those recommended by the society last year. Adopted.

Dr. Morse, from committee on reception, stated that several of the hotels in the city had arranged to entertain members at the reduced rate of $2 per day; the high price of provisions and dull times prevented them entertaining them free as heretofore. The Planters' house, Olive street house and Everett house were named.

A letter was read from Mr. H. M. Vories, of Buchanan county:

ST. JOSEPH, December 28, 1866.

H. T. MUDD, *President State Horticultural Society:*

DEAR SIR: I am in receipt of yours, accompanying a copy of report of state board of agriculture, etc. You have my thanks for the report, and also for your kind invitation to be present at your meeting of the 8th of next month. We have a society here to promote horticulture in this region; are getting along pretty well; hope to do better next year.

Our people here have been a good deal aroused on the subject.

Myself and partner have commenced setting out a vineyard and a general assortment of fruit trees and small fruits near this place. We will next spring enlarge a little, and expect then to have some twelve acres in grapes, about six hundred pear trees, six hundred apple trees and small fruit in proportion, and several of our neighbors are doing likewise. In fact, we are determined to test the capacity of this portion of the state for the production of fruit and for the making of wine. We have made some wine this year of good quality.

Mr. Madenger, near this place, I think, has made some wine of

most excellent quality. We have no further doubt about the practicability of producing grapes and making wine in this part of the state. I wish I could be with you on the eighth, but our court will interfere. But I hope to receive a copy of the proceedings in some form; I would be willing to pay for it any reasonable price. I feel great interest in what you do and say on the subject to be considered.

I am, very truly, etc.,

H. M. VORIES.

Dr. Clagett called attention to the importance of obtaining uniformity in the size of fruit packages, and moved the appointment of a committee to examine the matter and report.

Mr. Riehl had been looking into this question, and found there differences much greater than he expected. He had examined many fruit boxes, and found them of all, from 110 inches below a bushel, to 330 inches more than a bushel. He did not like the small boxes; was for justice toward the public and toward other fruit men. He went into details to show the important differences this made in marketing fruit. As to the cost of boxes, handling, and price received, he denounced scant measure, and instanced a grower that just cut off half an inch all round his boxes. These tricks of trade told against the fair dealer, and suggested uniformity in the sizes of boxes, and calling on the legislature to interfere and regulate the same.

L. D. Votaw thought this would be finding a stick to break our own necks. This will lead to the inspection of fruit packages and charges thereon, and to the loss of fruit by delay and other inconveniencies.

Dr. Clagett: If we don't take the matter up, others will. The matter has been already before the city council, and they can order the inspection of the boxes, and make us pay for the inspection. We will find it better to do this ourselves.

Adjourned.

AFTERNOON SESSION.

Society met at two o'clock.

The report of vineyard committee was called up.

Mr. Husmann said that he had made a partial report only, that Mr. Flagg, who had not yet arrived, had an additional report.

My report must necessarily be brief and almost purely local, as manifold occupations prevented visiting much abroad. I shall, therefore, confine myself mostly to my observations among the vineyards at Hermann and vicinity, and take the varieties in alphabetical order.

Adirondac—Has not as yet fruited; seems here a fair grower, and tolerably healthy in foliage.

Allen's Hybrid—Was everywhere destroyed by frost, and had no fruit. Made a tolerably fair growth of wood; requires winter protec-

tion, and is much subject to mildew, and premature dropping of leaves. Fine quality when ripened in perfection, which, however, is rarely the case.

Anna—The superior quality which its disseminator claims for this variety, is here, at least, hard to perceive. It is a poor grower, tender, subject to leaf blight, and of poor quality.

Alvey—A slow grower, but productive, and of superior quality; will no doubt, make a very superior red wine. Not subject to rot or mildew.

Arkansas—Healthy, hardy and productive; much like Norton's Virginia. Has had uniformly good crops for six years.

Arrott—Resembles Cassady very closely. Produced well, but is apt to drop its leaves; not subject to rot, thick skin, but makes a good white wine.

Baxter—Very large bunches, medium sized berry, too rough for table use; may make a fair wine; very productive, but is almost too late for our latitude.

Blood's Black—Uniformly good bearer, healthy and hardy, of very fair quality for so early a grape.

Brown—Somewhat better than Isabella, ripens more equally, and seems to be more robust and healthy.

Concord—This old favorite has again given very satisfactory results. Although it rotted in some localities, yet enough will always remain to give a good crop. It should have plenty of room, long pruning, and most of the fruit grown on laterals. It seems to be the safest of all varieties we yet have for general cultivation.

Clara—Was nearly everywhere winter killed, as it had not been protected, consequently no fruit. With protection in winter, it is tolerably productive and of very fine quality—better than Allen's hybrid.

Creveling—Grows rather slow, but is hardy and healthy, productive, of very good quality; loose bunch, better than Hartford prolific, though several days later, and will no doubt make a superior red wine.

Cassady—Had a fair crop of well ripened fruit, but is somewhat subject to leaf blight; not subject to rot. Makes very fine white wine.

Clinton—Hardy and productive, and will make a very fair red wine, though in my opinion far from being equal to Norton. The vines were, in our neighborhood, subject to excrescences on the leaves, which appear about midsummer, in consequence of which the leaves wither and drop. A serious drawback, in my estimation, to the general cultivation of this variety.

Cunningham—Had only a small crop, even where protected through the winter; but as the vines had two very heavy crops in succession, they may have been somewhat exhausted. The fruit was of fine quality, and the wine will be very superior. Vines made an ex-

uberant growth of well ripened wood, and promises a heavy crop for next year. A promising variety.

Cape—Very little fruit, and poor growth. Unworthy of cultivation by the side of Norton's Virginia, and others of the same class.

Cynthiana, or Red River—Had a very fine crop again of well ripened fruit, and is at present, I think, the most promising of all we have for red wine. Is a uniform good bearer, hardy and healthy, makes the best red wine I have yet tasted, but is very difficult to propagate, and consequently very scarce and high yet.

Catawba—Has been good in a very few vineyards, and worthless in others. Nearly all the old vineyards of it were destroyed, as, in consequence of the very wet summer of 1865, the vines did not ripen their wood, and were winter killed. A few vineyards, however, made an exception, and produced as fine a crop as I ever saw of that variety. The cause seems to be that the soil in these is better adapted to that variety. Southern slopes, on very high hills, and with a sandy subsoil mixed with clay, seem to produce the best results.

Canby's August—Hardly worth cultivating, though early and of fair quality; it is a poor bearer.

Cuyahoga—Entirely worthless here, subject to leaf blight, poor bearer and insipid. The poorest white grape I have tried.

Delaware—Has again been very much subject to leaf blight, although it seems to be more healthy on sunny slopes, where the soil is naturally drained, mixed with sand and limestone, and at the same time very rich. Whoever is the fortunate possessor of a location which suits the Delaware, should plant it by all means, as it makes one of the finest white wines yet produced; but I fear such locations are "few and far between," and it has now been sufficiently proven that the Delaware is not, in this state, a grape for general cultivation.

Diana—As fickle as the Catawba, and, I think, the same locations which suit the latter will also suit this. There has been little fruit on the vines, and that of rather poor quality.

Devereaux—Is somewhat tender, and subject to mildew, though of superior quality. The vines had little fruit, and were affected by mildew; should be tried on soil similar to that described as best for Delaware, as it is too good to be given up without a thorough trial.

Dracut Amber—Healthy, hardy and productive, very early, but so abominably foxy that it is hardly fit for cultivation.

Ewing's Seedling—Very productive, and better in quality than most of the Isabella class, perhaps the best I know of them.

Northern Muscadine—Hardy, productive and very early, but also very foxy, not as much so as Dracut amber, much the best grape of the two; drops from the bunch when fully ripe.

Elsinburgh—A very nice little grape, of fine quality and healthy habit, but very unproductive.

Franklin—Similar to Clinton in habit, but far inferior to it in quality and fruitfulness. In my opinion, unworthy of cultivation—a disgrace to the name it bears.

Garrigues—Similar to Isabella, somewhat better in quality, and ripens more uniformly.

Garber's Albino—Of good quality and early, but very unproductive.

Golden Clinton—Resembles the Clinton in growth and foliage, the Taylor in fruit and color; had but little fruit, but may improve, as this was its first season, and should it prove productive, would, perhaps, be very desirable as a white grape for wine.

Hartford Prolific—Had a fine crop everywhere, and of very fair quality; will, under proper treatment, make a very good wine, and is very reliable, hardy and healthy.

Herbemont—In most of the vineyards the vines had not been protected, and consequently had only half a crop. The fruit was very fine, however, ripened well; the vines ripened up their wood better than I have yet seen it, and promise a splendid crop next year. It is one of our most reliable grapes wherever the soil is adapted to it; but it wants a sunny, dry slope, with light friable soil, intermixed with limestone, to bring its fruit to the greatest perfection. It is enormously productive, and well worth the little extra care of covering, for which its delicious fruit so richly pays. It makes one of the most delicate wines we have, and comes nearer to the choice Rhenish wines than any other grape we have yet tried. It was perfectly healthy this season.

Huntingdon—Ripens very early, very productive, belongs to the same family as the Clinton, but not as spicy, nor as much "frost grape" flavor about it subject; to the same leaf disease; needs further trial

Iona—Another year has but confirmed my good opinion of the quality of this fruit, and my very poor opinion as to its adaptability to our soil. It set its fruit very imperfectly, and rotted and mildewed worse than any other variety I have seen, the Catawba not even excepted. It would be foolishness, nay, even wickedness, to recommend it for general planting here.

Israella—A poor bearer, of poor quality, and a week later than Hartford prolific, which is better with me in every respect than this overpraised pet of Grant authority.

Ives Seedling—Has not fruited yet, but seems to be a good grower and healthy, evidently a true fox in foliage and habit.

Kingsessing—Hardly worthy of cultivation, belonging to the Catawba class, but hardly as good.

Logan—Productive and hardy, but a very loose, straggling bunch, resembling Isabella in quality; not very desirable, as it is no earlier than Hartford, and hardly as good.

Lenoir—A good grape, but very poor bearer.

Labe—Of no particular merit.

Louisiana—A delicious little grape, and will make a very fine wine, resembling Rulander very much, but of a more delicate flavor; seems to be somewhat unproductive, but may improve with spur pruning, and certainly deserves to be universally tried, as it will, perhaps, make the choicest white wine we yet have; healthy and strong grower.

Maxatcaerny—A beautiful fruit, and as good as beautiful; vine strong grower and healthy. Should it prove productive, of which, as yet, we are not fully satisfied, it will be one of the best white grapes.

Martha—Had a good crop; ripened it uniformly, and is very sweet and rich; promises to become a leading variety, as it has the strong, healthy habit of its parent, and may one day make the white wine for everybody, as the Concord will make the every day red wine of the people; sweeter than its parent and a few days earlier.

Mary Ann—Desirable as the earliest market grape, coloring a few days before Hartford; very productive and healthy.

Marion Port—Of not much value where better can be had.

Norton's Virginia—Some persons seem to have been very busy to circulate the report that this old favorite had given out. This was only the case where the vines had either been killed by overbearing, or the vines had been defoliated by late and excessive summer pruning. In the majority of vineyards it was as fine as ever before; ripened a good crop, and made a fine, healthy growth of wood. It may be as safely and confidently recommended as ever, and will, under reasonable treatment, produce an average of five to six hundred pounds per acre every year.

North Carolina Seedling—A showy and rather early grape, of very fair quality, and desirable as a market fruit, as it has a large berry, fine bunch, and is very productive and healthy.

North America—Too unproductive to be of any value.

Oporto—One of the basest humbugs with which the American people were ever outraged; neither fit to eat, nor will it make wine fit to drink.

Ontario—Resembles Union Village closely, somewhat tender; bunch and berry very showy and of fair quality, somewhat subject to leaf blight. Did not have any fruit this year.

Poeschel's Mammoth—Showy, very large, vine healthy and tolerably productive; desirable as a fancy variety, ripens late.

Perkins—Very productive and very early; this and its handsome lilac color make it desirable as a market grape; always healthy and hardy, sweet but foxy.

Rebecca—Good quality, but too uncertain and tender. Had but very little fruit this year. Not desirable except as a fancy variety.

Rulander—Healthy and tolerably hardy; makes a wine of superior quality, but is rather unproductive. Should be more generally tried.

Rogers' Hybrids—I fruited eight of these for the first time this season, and No. 1 the second time, and think if but half as much gas had been expended as there has been lavished in praise of the Iona, Israella and Adirondac, the grape growing public would be much better off, as their healthy habit, free growth and good quality seem to entitle, at least some of them, to the highest praise. No. 1 is a very strong grower, very productive, bears a medium sized bunch, with very large, oblong, lilac colored berries, which have not suffered in

the least by mildew and rot, and makes a delicate white muscat wine. Nos. 3, 9 and 12, I think, are very promising as wine grapes, and No. 19 is almost as large in berry and as good as black Hamburg. The best of them, as a table grape, which I have, however, is one about the identity of which there seems to be some doubt. It is a medium sized bunch, rather loose, berries full as large as Concord, black, very juicy, sweet, little pulp, and very fine flavor. This I cultivate now as No. 22, but am told that the true 22 is a red grape. Be that as it may, it is one of the best grapes I have tasted this season. No. 15, however, which, by many, is lauded so highly, is here subject to mildew and rot, and I think of indifferent quality.

Taylor, or Bullitt—This little grape is, I think, not estimated as it ought to be. It certainly makes one of the best white wines we have at present, is a very free grower, easy to propagate, hardy and healthy, with the exception of the excrescences on the foliage, which it seems to have in common with the Clinton, though not to such an extent. It may want another variety to impregnate it, as its flowers seem to be somewhat imperfect, but I have seen very fine crops of it with long pruning, and as its wine will easily enough bring six dollars per gallon, it will pay well even should it not produce very largely. It is certainly preferable, for general culture, to the Delaware, and should be extensively tried. It had a very fair crop this season.

To Kalon—Too uncertain to be recommended, though of a good quality.

Union Village—Produced but little this year, as it is somewhat tender.

Among the novelties of most promising character, I will here mention a seedling of the Norton, grown by Mr. Francis Langendorfer, about six miles from Hermann, of which samples of wine have been made, and are now before your committee. It is a black grape, somewhat smaller in berry even than its parent; ripens about a week later; bunch long, sometimes eight to nine inches, compact, shouldered; berry small, round, not very juicy, but without the dark juice of its parent; the wine has a brownish yellow color, is of great body, splendid flavor, resembling the best Madeira. The vine is a strong grower, with beautiful foliage, and very productive—more so than its parent. This may be a valuable acquisition for our state and the south, as it would ripen too late for a northern climate. Wine has been made from it twice, with equally good results. I have watched this seedling (the only one from nine which were grown side by side which proved fruitful) with a great deal of interest, and believe that it has a great future before it; is, perhaps, the only grape we now have which will make a wine fully equal to Madeira. It is not yet for sale; therefore, there are no "axes to grind" by it.

Among the vineyards visited here were Mr. William Poeschel's, who made a very fine crop of Catawba, Concord and Norton, and a pretty fair one of Herbemont; that of Mr. Langendorfer, who had also

a fine crop of Norton and Concord, with a few vines of his new seedling, very full. Mr. Michael Poeschel's, whose fine vineyard of Norton's Virginia, which bore such an abundant crop last year, is nearly all dead, owing, I think, to a retentive clay subsoil and excessive late summer pruning. He had a splendid crop of Concords on a young piece of vineyard the third year from planting, about as fine as I ever saw, and, also, some good Catawba on young vines; his older Catawbas are also dead and he has replaced them already with Concord plants. He has several promising seedlings from the Delaware, but as they have fruited but once, we will watch and wait for another year. Mr. F. Noe, who made but a small crop; Mr. Thaler, who had a very fine crop of Catawba and Concord on young vines bearing the first time, and Mr. Dilthey with a splendid crop of Concord. My experience I have already given in the description of varieties.

I visited Mr. J. Kelly's vineyard, near Webster, about the beginning of September, in company with Dr. Morse and Messrs. A. and E. Kehr, and found a fine crop of Catawba, Concords and Hartford prolific, and the best crop of Taylor I have yet seen. The vineyard is young, and had evidently received very good attention. From there we went over to Mr. Gill, near Kirkwood, to see the new foreign grape of which so much has been spoken, but, I am sorry to say, that it appeared to me as a Rebecca before I was aware which was the "distinguished foreigner," and subsequently exhibitions of the fruit at Hermann and St. Louis have almost convinced me that it is a Rebecca vine, which has only found a soil and location peculiarly adapted to its wants.

At the time of the St. Louis fair I visited, in company with our worthy president and Mr. Samuel Miller, of Lebanon, Pa., the vineyard of Mr. E. R. Mason, near Webster Grove. His Hartford grapes had been gathered, but a considerable share of his Concords were yet on the vines, and showed a tremendous crop, for many vines could evidently not fully ripen their fruit. Mr. Mason is a careful cultivator, and his vines were in perfect order; but he is evidently asking too much of them—more than even so hardly and robust a variety can stand. His Norton's Virginia were mostly gathered, but those yet left showed great perfection and the vines looked well. The Herbemont is evidently not quite at home in the soil at Webster.

I am glad to report a considerable progress in grape culture in all parts of the state. The interest of the people is thoroughly awakened to the importance of this branch of horticulture, and everywhere we hear of and see vineyards being planted. Especially is this the case in Jefferson county, on the Iron Mountain railroad, where a large number of acres were planted last spring and a good many more will be planted the coming spring. Among those largely engaged in it there I will name Messrs. Bush, Foster, Dyer, Newcomb, and a great many others. All report satisfactory progress. Several vineyards have been planted near Jefferson City, near Hannibal, St. Joseph, Weston, Kansas City—in short, everywhere in the state. Augusta, in St

Charles, and Washington and Miller's Landing, in Franklin county, are progressing rapidly. But a comparatively new feature in grape growing was inaugurated in the Bluffton wine company, a stock company founded on the mutual interest principle, which is making rapid and satisfactory progress. The advantages of colonies of that kind, connected by a common interest, must be apparent to every one. It will be a great saving in cellars and all the necessary apparatus, and be a mark for the surrounding country, facilitate sales, and if the wine is kept in one cellar, in large casks, and under a uniform, skillful treatment, it will necessarily be a better article and command better prices. I hear already of several other companies organizing, and if the success should be as good as can be reasonably expected, we will soon see the state covered with grape colonies, where even the poorest vintner can find a home, and, if he is willing to work, gain an independence.

In summing up last seasons's experience, connected with the experience of the foregoing, it would seem to show the following results: 1. The necessity of underdraining in soils retentive of moisture. 2. However robust a variety may be, it can be overtaxed, and vintners should be careful not to overload their vines. 3. That early and close summer pruning, in furthering the development of the blossom and fruit and creating additional leaves, is highly beneficial. 4. That late and severe summer pruning is in the highest degree reprehensible and injurious, as it causes stagnation of sap at a time when its functions are all important to perfect the fruit, and also to ripen the wood of the vine. 5. That there are certain insects which should receive close attention at the hands of every vintner, as they have increased to an alarming degree in the last few years. Among these I will name the rose bug, the leaf-folder and the white thrip. These threaten to seriously injure the crop, and it should be the business of every grape grower to try his best to find a remedy against their ravages. 6. That the tremendous increase of grape growing demands at our hands a separate organization, whose object it shall be to hold at least some annual meeting and exhibition, one in fall, a show of grapes and exhibition of wines of the foregoing season, and one in spring, where the wines made in the fall may be exhibited. These meetings of all the grape growers of the state, with which several days' discussions on grape culture exclusively should be connected, would assist the cause a great deal more than horticultural meetings and agricultural shows, where, in the former, the apple, peach and strawberry, and in the latter, the horses, cattle and pigs are the greatest part of the attention and discussion, and the grape comes at the tail end, and gets the leavings. Such an institution is a necessity for our state above all others. Let us then show that we are conscious of the importance of our calling.

Dr. Edwards remarked that in the report just read the Ontario and Union village were classed as two distinct grapes. The American pomological society thinks them identical.

Mr. Husmann: Doctors often differ. I think myself that the difference here is very slight.

Mr. Jordan desired a description of the "rose bug."

Mr. Husmann: A small grayish bug, with a few dark spots on the wings; size about that of a horse fly, and eats holes in the leaves. It was this insect that injured Mr. Poeschel's vineyard so much.

Mr. Tice: As to the disease on the leaves of the Clinton, I think it is an insect of the "gall fly" species; in examining the galls on the leaves I have found the eggs. Its ravages seem confined to the vitis cordifolia.

Dr. Hull concurred with Mr. Husmann in regard to late summer pruning. He had seen late summer pruning followed by the worst results.

Mr. Jordan complained of the manner in which Mr. Rogers had sent out his Hybrids by numbers in the place of names, as tending to confusion. Some of the varieties are very good. He had seen varieties that were very different having the same numbers. He agreed as to the injuries of late pruning. It should all be done immediately after the vine blooms, with the finger and thumb. It should be done when you can get hold of the leading fruit cane after the third bunch of fruit is set. The leaves once opened are better left on the vine, as it gives a destructive shock to the whole vine.

Mr. Husmann: These are the views I have adopted and advocated for ten or fifteen years. Some won't discriminate as to time. I was one of the first to advocate early pinching.

Rev. Chas. Peabody called attention to a new work on vine and grape culture, by Mr Husmann. He regarded it as the best work yet issued for the west.

Mr. Allen said that there were some suggestions in the president's address that merited the attention of the society, and upon the understanding that he would not be placed on said committee, moved that the secretary appoint a committee of three to whom shall be referred the president's address, with instructions to report. Adopted.

The secretary announced Messrs. E. R. Mason, J. M. Jordan and Dr. Hull said committee.

The president appointed as the committee on fruit packages Dr. H. Clagett, Messrs. E. A. Riehl, L. D. Votaw, Geo. Booth, Geo. Husmann.

Dr. Morse, from business committee, offered the following preamble and resolutions:

The business committee learns with regret that one of the representatives in the legislature from this county, and an ex-president of this society, has so far apostatized himself from the true faith, as to express himself in favor of an absorption of the agricultural college fund by the state university; in other words, he "has sold out" to the Columbia university influence; therefore, we propose the the following:

Resolved, That we believe it to be impolitic and contrary to the

best interest of the cause of agricultural education, and contrary to the design of the act of Congress, that the agricultural college fund should be appropriated to existing literary institutions.

Resolved, That our representatives are hereby requested to vote for an independent organization of the agricultural college.

Dr. Morse: I present this because I think that that gentleman wants an expression of opinion by this society.

The president suggested its reference to a committee.

Dr. Edwards moved that the resolutions and Mr. Colman's communication be referred to a committee, with instructions to carefully consider the same and report.

Mr. C. M. Saxton would like to have a time fixed to receive the report and discuss the subject, as it was one of great importance.

Mr. Tice thought it had been the almost universal feeling among members and others that the industrial college should be separate and distinct from any literary institution. He favored referring it to a committee, in order to get a full expression of the views of the society.

Dr. Morse was in favor of referring—thinks the influences thrown around men in Jefferson City very seductive. Upon one point I differ with the writer of the letter. He says that "fifty cents" per acre is all we can get for the college lands. The large proportion of these lands are selected along the railroad at $2 50 per acre, and within six miles of it. Mr. Fremont is selling lands alongside of these at five dollars an acre. I think that these lands can be sold on long time at perhaps 8 per cent. interest. I think that there are wrong impressions in regard to the value of attachment to the state university.

The president: The gentleman went to Jefferson City opposed to consolidation.

Motion to refer agreed to.

The president appointed Messrs. Tice, Clagett, Tracy, Lear, Harris as said committee.

Prof. J. L. Tracy read the following essay on the Moralities of Gardening:

"When Adam delved and Eve span,
Who was then the gentleman?"

This homely distich of Jack Cade poetry is full of the spirit of a sans culotte revolution; a spirit that would bring everything else down to its own level. It is our business, however, to level up, and not to level down. We seek to educate, and thus elevate the masses; and in this way make the cultivators of the soil the true gentlemen of the land.

Simple drudgery, without intelligence or proper motive, tends to degrade and brutalize the mind. This is fully illustrated by any system of slavery or serfdom, where daily toil is stimulated by no higher motive than compulsion, or a meager per diem that will barely supply physical wants. There is little inducement to cultivate the higher powers of a god-like nature, and the man becomes a mere animal, who,

like the horse or the ox, performs his daily task, eats his daily food, sleeps through the night, and keeps up through a weary life this monotonous round of toiling, eating, and sleeping. This and nothing more.

The mind must work with the body. The brain and nervous system must be active as well as the muscles. Without such a union but little will be accomplished; this little will be badly done, and the whole system exhausted by the unnatural effort. Compulsory labor, or that which is performed without adequate motive, does little to develop and strengthen the physical system, while it leaves the intellectual and moral part of the man to dwindle away and finally be extinguished in darkness, debasement or crime. The poor galley slave, who toils hopelessly as he is chained to the oar, may bring a little more blood to the muscles of the arm, but his whole physical system will pine away and die under the ceaseless labor and hard discipline of his post.

A poor student feels the necessity of exercise in order to preserve the grand equilibrium of a sound mind in a sound body; and so he volunteers, without fee or reward, to saw up his landlord's wood pile. He works away a few days without any result but physical exhaustion, and gives up the job. His landlord then offers him three dollars a load to do the work, and the exercise becomes most healthful and invigorating. He tries walking for the same laudable purpose, and strides away through streets or fields without any aim or purpose except to take exercise, and returns to his room merely exhausted. Now, if he had been on a visit to his sweetheart, or had gone for the accomplishment of some object of business, he would have returned with his legs and his mind both elastic, and feeling all over a fresh glow of health and strength.

Not only an adequate motive to exertion, but competent knowledge of the business, is requisite to insure success. Intelligence is just as necessary to the tiller of the soil as to the philosopher who measures the heavens and weighs the stars in a balance. The intelligent laborer not only accomplishes more, but does it better and with less fatigue than the man who toils with nothing but blind brute force. The intelligent laborer accomplishes most because he knows how to apply strength to the best advantage. He never strikes a lick amiss, and every blow counts. A stream of water filling a pipe one foot in diameter, if properly applied, is sufficent to run a hundred looms and a thousand spindles. Without such application it would not grind a grist of corn. I remember once to have seen in Kentucky four or five stout negro slaves trying to load upon a wagon a stone hewed into the shape of a door step, weighing seven or eight hundred pounds. After tugging, lifting, straining and sweating over the job for an hour or two, and being no nearer the accomplishment of the work than when they commenced, a cute Yankee came to their aid, and, with the use of a lever and inclined plane, loaded the stone by himself in fifteen or twenty minutes.

That an intelligent laborer does his work better than an ignorant one, is a proposition so plain that it needs no demonstration. The opposite of this would make a bungling blacksmith the best man to repair a chronometer.

The intelligent laborer performs his work with more ease, less fatigue, less waste of physical power than the ignorant man. In the former case there is the happy union of brain and muscle. The brain teaches the hand how to operate to produce the greatest result with the least possible exertion. An ignorant operative with the scythe, hoe, spade or rake, would soon find himself exhausted with illy directed efforts to keep pace with a man of less muscular power but of more intelligence and experience—one who had learned the best application of mechanical force. But above all this is the moral power, the motive that stimulates the brain and moves the hand in the performance of its work. This leads us back to the subject of our brief essay, the Moralities of Gardening.

It is doubtful whether there is another occupation of life that so mingles the useful and the beautiful as horticulture. It made the Eden of sacred history, and the garden of the Hesperides in classic lore, each filled with all those productions of nature that charm the eye, please the taste, excite the imagination, and elevate the moral feelings. In our modern Edens we have added another powerful incentive—they yield the dollar.

The gardener, in the vicinity of a large city like St. Louis, finds that everything will pay, from a cabbage rose to a cabbage head, and each one prospers just in proportion to the amount of intelligent care and cultivation bestowed upon his fruits, flowers and vegetables. The natural desire for wealth is tempered by many kind and humanizing influences, and the man who seeks a decent competence in the cultivation of a garden runs no small risk of being transformed into a miser or a millionaire. Suppose, if you please, the case of a man possessing two or three acres of land within easy distance of St. Louis. This is his only earthly possession, but with intelligence to plan, and industry to execute, it will be quite sufficient for himself and family. He devotes half an acre to strawberries, which, with careful cultivation, will bring from three to five hundred dollars a year. He puts an acre in good table grapes, like the Concord, which, after two or three years, will bring an annual revenue of from eight hundred to two thousand dollars. He gives another portion of his ground to the cultivation of other small fruits and vegetables, and finds as the result of his labor an increase of two thousand dollars a year, besides the products that are consumed in the support of his family. He becomes quite as independent as the cotton planter or hemp grower, who owns a thousand acres of the best land in Mississippi or Missouri. He has enough to supply all the necessaries and comforts of life without inciting him to be covetous or avaricious. He has enough to feed, clothe and educate his children, and supply the reasonable wants of a family. What

more should a rational man desire? Let such a man, with practical knowledge of the work to guide his hands, and the pressure of such motives to move his heart, once take hold of the spade, the hoe, or the rake, and notice the results that will follow. This man will grow, not only in wealth but in moral stature, from day to day. His associations are with all things lovely, true and beautiful; and he would be less than human who should not catch some holy inspiration from the objects that surround him. The man who lives in close communion with all that is lovely and beautiful in a well ordered and well cultivated garden is rarely capable of committing a vulgar crime. Such a case would be proof of great moral obliquity in the constitution of the individual.

Another important bearing of this subject is the powerful influence it exerts in promoting the health, increasing the beauty and educating the taste and moral sense of women. If the daughters of America would spend a fair portion of their time in cultivating fruits and flowers, they would not only be happier and live longer, but coming generations would have occasion to bless them for such a course. The fact is, there is something radically wrong in our whole system of education for either girls or boys. It lacks harmony and adaptedness to the wants of a civilized people. We sacrifice everything to a single object. We strive to make either an animal or an angel—all muscle or all mind—and the result is frequently a monster.

This leads me to allude very briefly to one of the grandest movements of the age—an effort to educate the cultivators of the soil up to a high standard of intelligence; not to make them too proud to work, but to make their work easier, more efficient, and give to the workers themselves a larger share of true happiness. The object of an agricultural college is to dignify labor, as well as to make it more profitable. This last is accomplished by giving to students instruction, not only in an ordinary course of science and literature, but theoretical and practical knowledge upon all subjects connected with the management of a farm or garden. Let us hope that the progressive spirit of the age will ingraft upon every institution of learning a feature of this kind, so that both sons and daughters may learn more of the healthfulness, beauty, pleasure and profit of rural life and the intelligent cultivation of the soil. Then our sons will find more pleasure in the management of a farm than living exposed to the seductions of vice and crime in a great city; and our daughters will find more health and happiness in attending to a patch of strawberries or a parterre of flowers than a season of frivolity and dissipation at Newport or Saratoga.

THE RASPBERRY.

Dr. Clagett: I would like to hear the experience of some of the members upon raspberry culture, and I think Mr. Mason could give some information.

Mr. E. R. Mason: I have tried several varieties; the Doolittle most largely, had half an acre of Philadelphia, some Franconia and Kirtland, and regard the Philadelphia as the most promising of all the "reds" for this state. It is a very vigorous grower, throwing up strong canes like the Allen, and does not sucker. With correct pruning there is no necessity for staking. The fruit is not first quality, but good, and very productive, very firm and solid, and good for market, but increases slowly. Stands freezing well.

I take the roots, cut them in short pieces and start them in "bottom heat." I tried propagating from the tips, but it did not do well. In the hands of another gardener a good many started, but did not make a good cane. It is distinct from the blackcap family, and seems to belong to the European family.

The Franconia has been of no account with me.

The Kirtland is next best to the Philadelphia, small in size, and not very productive; is earlier and of excellent quality, good for family use. These are the only red varieties tried by me, except the everbearing.

In answer to question—Is it more productive than blackcap?

Mr. Mason: Don't know. Blackcap sells at from eighty cents to one dollar per gallon; the Philadelphia brings two dollars easily.

Philadelphia—Is later. It does not branch much. I keep them trimmed, and get strong, upright wood.

Doolittle—Is profitable; have about eight acres; plants four feet in the rows, six feet apart; think eight feet would be better. In Pennsylvania they raise two hundred bushels to the acre; here one hundred bushels is nearer.

Dr. Morse: A year ago I found a Philadelphia rooted at the tip in my grounds. This year I watched them, and find there is quite a tendency to root at the tips. If put in too deeply they "damp off." I think it is a different family. As it sends up few suckers, this may be worth noticing, and I should watch it with interest.

Mr. E. R. Mason: I would not recommend propagating in this way, but by sections of the root in a hotbed.

President: Is any one prepared to say whether the Philadelphia and St. Louis are identical?

Mr. Riehl: They are unquestionably different.

J. S. Platt, Chicago: I would like to be informed as to the size, brilliancy of color, hardness for transportation of the several red varieties.

E. R. Mason: I know nothing of the St. Louis. Philadelphia, as to size, it is larger and solider than Kirtland or Allen, much larger than Doolittle—as large as three Doolittles; color is bright, much like the Allen, bears transportation well.

Mr. Riehl: I have been cultivating the St. Louis, and it has done nothing for me thus far. Philadelphia is the most promising red variety we have.

J. S. Platt: I don't know of any raspberries that are as large as those coming from Michigan. The red berry is too little in our markets. A fine red berry comes under different names. The Michigan berries are always the largest.

E. R. Mason: The purple cane has been largely sent to market by Mr. Purdy, of Indiana.

J. S. Platt: With us people don't like the color.

Mr. Tribeane: I think much of the raspberry for honey. I have corresponded with Mr. Parry, New Jersey; Mr. G. W. Campbell, Ohio; Mr. Purdy, Indiana; Mr. N. J. Colman, St. Louis. Parry thinks Philadelphia far ahead of any other—far ahead of Catawissa. Campbell says Kirtland is best; not much experience with Philadelphia. Purdy thinks Catawissa does better. He cuts all the canes to the ground, and gets more money for its fruit in the fall. I want to raise money.

John Huggins: I would name the Ohio everbearing. It is a profitable berry, perhaps the best among the blackcaps. It is the only truly everbearing variety with me. Tried the Belle de Fontenay and Catawissa. The Ohio is best; get a good crop at the usual time. These canes are cut down, new ones come up, and in about a month we have another crop, and then from that till frost. It is difficult to propagate, so much so that I never had plants enough to supply my demand. A few plants will give fruit for a family the whole season.

Mr. Snedeker: I agree with Mr. Huggins as to the Ohio. Tried the Belle de Fontenay seven years, and don't think I ever saw a good berry; it is one of the most worthless I have ever seen—a bunch of seeds with some half and quarter berries.

Mr. Tribeane: I would ask about the daily-bearing raspberry?

Mr. Huggins: The Ohio is that.

Mr. Pettingale: On the sixth December my daughter gathered a dish of fine, ripe berries from the Ohio everbearing—sufficient for a large family. If the Doolittle is superior in quality and productiveness at its season, I can get a peck from the bush at the first picking, and there are always green and ripe berries on the bush till frost.

Mr. George Husmann had known the Ohio fourteen years, and can confirm all that has been said.

Mr. Pettingale is raising seedlings from this that may show something valuable.

Mr. Huggins: It is with me perfectly hardy, is never covered, never killed. If the cane is broken by accident, a new cane comes up with the bloom on its tip.

Mr. Mason: Belle de Fontenay is a red berry, different from the Ohio, one of the best in quality of the red varieties; is perfectly hardy, not quite perfect in the fruit, but the quantity makes up for this; have fruit till the ground freezes; never market them.

Mr. Snedeker: I received some plants from Arkansas of a fine raspberry, and, set side by side with the Ohio, I can see no difference.

Dr. Hull: I received it eighteen years ago—sent from the Choc-

taws; had it several years, and found it the Ohio everbearing. It is all that is claimed for it. It is almost impossible to propagate it. The tips are always set for fruit. A lady has done it so successfully by laying it down and covering it with forest leaves, and the fruit canes are changed into wood and roots. They are easily propagated by cutting into sections and setting in a hotbed at 90°. As to the Belle de Fontenay, I introduced it about seventeen years since. In the grounds of Ellwanger and Barry they thought it best. I sent it out, and it was cultivated to such an extent by my neighbors that it would not bring five cents a quart. It will produce a larger crop upon its canes than any other. I think it a good variety to cultivate for this market, or any near market.

Mr. Hilliard: I saw last year, in Minnesota, the raspberry growing wild, much larger than I ever saw in the gardens, and I came to the conclusion we are too far south to grow the raspberry in perfection.

Mr. Tribeane: There is a berry making a great noise in the east called the thorny blackcap. Has any one fruited it here?

Mr. Snedeker: The purple cane is thorny, a large berry if you cultivate well, don't bear shipping well, is good for table; from a dozen plants you have enough for three meals a day, and make preserves and wine of them, too. Belle de Fontenay requires good, clean, careful cultivation.

Dr. Hull: Is just such a cultivator that it is likely to do well with.

Dr. Spalding thought much of this difference of opinion was due to the differences in soil and climate.

Adjourned.

TUESDAY EVENING SESSION.

The President called upon exhibitors of fruit to specify their varieties so as to have them correctly listed for the committee.

Mr. T. R. Allen, Allenton: Genitan—good, hardy tree, early bearer, bears well on alternate years; two distinct colors of flesh, the yellow and the white.

Newton Pippin—Good, not so profitable as genitan, brings one to two dollars per barrel more than genitan; tree not so hardy, a favorite in this market.

Winesap—Not much difference between this and genitan; fruit more evenly distributed over the tree, not so much tendency to overbear. Genitan and winesap the two most valuable market varieties.

Ortley—Good, not profitable; is not raised with success here.

Rome Beauty—Fine, good bearer; trees are young, fruit stung badly and dropped from the tree; fruit of fine appearance, good size; some others worse stung.

Wagner—Fruited first this season; good, flesh tender, juicy, pleasant, good for eating, ripens regularly.

Smith's Cider—Fair specimens; think much of it.

Rambo—Stung by insects, wormy at core; no fruit so good or keeps so well this year; is one of our best fall apples.

Michael Henry Pippin—Tree thrifty, hardy, promises well.

Swaar—Not good specimens.

Mr. O. H. P. Lear, Hannibal: I would call Mr. Allen's attention to the rambo. There are often differences in the trees. I am inclined to believe there is much to be attributed to the influence of the stock. I have seen proof of this in the case of a square of sixteen trees grafted about three feet from the ground, planted in 1851; they will all die in three to four years more. The influence of the stock is seen in the fruit. I have one tree grafted two feet from the ground with the body much thicker than the stock.

Rambo—Gathered them in October. I think there is a difference in these two fruits. (Mr. Allen's and Mr. Lee's rambos.)

Smith's Cider—Fruited 8 to 9 years, overbears and breaks down the trees; fruit number one; profitable apple; will keep with good handling till March.

White Winter Pearmain—Trees bearing three years, in hopes they will take the place of the genitan; good bearers, strong growers, almost upright; not lost a tree in forty. One of the most saleable apples in Hannibal; sells at from one to two dollars more than the genitan.

Genitan—Our standard apple, more admirers by ten to one than any other tree. I prefer the winesap. Bears fair crops everywhere every other year; in some cases fruit cracks and dries up.

Little Pearmain—Slender, upright grower; apples hang well on the tree; keep till June or July.

Little Romanite—Hardy, thrifty tree, fair bearer; keeps well.

Limber Twig—Brought from Kentucky in 1818. Keeps easily till June.

Ortley—Is the king of apples, good grower, good bearer, sells for double the genitan; have a standing order from a firm in this city.

Peck's Pleasant—Has its right name; one of the best apples grown; trees perhaps tender; injured in 1855–56.

Winesap—Good.

Mr. Turner, Hannibal: I have a few varieties I will not describe, having been already taken up.

Mr. B. W. Davis, Belleville: Paradise Winter Sweet—good tree; upright grower; fine fruit; can be eaten in fall; keeps till May.

Tulpahocken—Large; high color; a good apple.

Gilpin—One of the most productive; bears well and full everywhere.

Limber Twig—True, fair sample, makes superior cider; very productive, as much so as the Gilpin; bears alike well on prairie and timber.

Pryor's Red—The best apple with which I am acquainted, best for eating and the best bearer.

Smith's Cider—Very productive. The two last years the tree blighted the worst in the orchard.

This wants a name—Mr. Lear says winesap.

Newton Pippin—Does well on Turkey Hill. On the ridges they do well; not on the prairies.

J. Snedeker: Long Island Pippin—Very good.

The hour set apart for the address of Mr. Smith having arrived, further comments on the fruit were postponed.

Mr. William E. Smith, of Alton, Illinois, then read the following interesting address upon the uses and influences of horticultural societies:

HORTICULTURAL ASSOCIATIONS.

That a drop of water is a wee bit of a thing, children sing; that an ocean of drops is a mighty, fearful thing, men know. That a man can do little, daily life tells us, but do we know what men can do? As a drop to an ocean, so a man to men. Dew drops were glistening on our lawns; rivulets ran to rivers, rivers to ocean; a mighty wind arose, and strong vessels went to pieces on rocky coasts. The blades of grass stood erect under the dew drops, but man, all his strength and all his skill went down before the storm.

The drop and the ocean have always been before man, and he has caught their lesson. To be strong, he must be with his fellows. As is the union, so will be the strength. In all relations of life men have accepted this law of union, and accorded to it willing allegiance. In relation to government, to state, to community, there is continued consolidation of man with man, and we note with pleasure an increasing tendency among the members of all professions and trades to form associations in which all may work together for the common good. Taking the lead in this good work stand the tillers of the soil, and more particularly the horticulturists—those drawn to one another by an all-pervading love of nature, whose souls have been purified, and whose lives have been ennobled by daily contact with the opening mysteries of an Almighty Creator's designs.

In every section of our country engaged to any large extent in the culture of fruit, flower and vegetable, associations have been formed with the view of inducing concert of action, and by this means, within the past quarter century, an extraordinary progress has attended horticulture. From the vaguest guess-work horticulture has been elevated to the most scientific procedures, and although yet in its infancy, a remarkable development has rewarded its energetic adherents.

Let us, then, consider what are the objects of these horticultural associations; what the influence they exert on the individual, as well as on the community. And, lastly, let us carefully note the duties.

Horticulture is both a science and an art. To its aid, as a science, may be called in various sciences; chemistry, to analyze the soil, to trace the magic changes in the growing plant, and practically to lead to greater returns; botany, to classify all the trees and plants, and to teach of peculiarities of natural growth; mathematics, to bring forth in regular formula the ascending series of trunk, branch, twig and leaf. As an art, horticulture demands untiring patience, ready skill, and indefatigable investigation, and it is as an art that the cause is principally promoted by association.

To consider in detail the first object of every horticultural society is to collect facts, and it is to be observed that facts are sought, and not theories. The method pursued is what is known as the inductive; facts are collected, and then theories are developed. But a different system has at times prevailed; the theories have been first made from the fertile brain, and if the facts when found did not match, in the words of an old French philosopher, "so much the worse for the facts." Every association is composed of members, all more or less engaged in the culture of fruit and flower; all have some experience, and each has facts to give. One has planted on a stiff clay, and has had complete success; one has planted on light sand with like result; others have done the same, and have experienced utter failure. These facts at first sight seem contradictory, and more must be learned before a satisfactory answer can be given. What was the preparation of the soil? What the peculiarities of the seed? What the culture, the season and the event of failure? These questions answered, new facts are evolved, which in their turn open the way for an endless succession of questions and answers; and from many sources facts may be acquired. An association is not restricted to the limited experience of its own members; in a measure, the combined experience of the horticulturists of the United States is at hand to be verified and confirmed for particular localities, while on many subjects the treatment of all European gardeners is accurately laid down.

But not only is it an object to collect facts: it is equally important to verify facts. "There are more false facts than false theories in the world," said the metaphysician, speaking in reference to the emotions of the mind; yet more true is this statement when applied to the facts of nature. Then to make sure of the absolute truth of facts becomes a second object. And in no place can a mistake be so speedily detected, or readily rectified, an exaggeration so quickly modified, or error so easily garnered from truth, as when first brought before the public. If the subject be a familiar one, all are anxious to interrogate closely; the speaker is at hand, ready to vouch for the truth of his statement, and willing to answer inquiries, until the full solution of the problem is attained, the casual misstatement reduced to proper proportions, or the inadvertent omission supplied. If the subject be strange and new, the attention of all members is directed, and an extended consideration devoted to the point.

Again, to classify the facts becomes a necessity for ready reference. The information on each topic is to be arranged by simple and clear principles under special heads. Considerations of soil and climate will introduce to the vast domain of the geologist and climatologist, already mapped out with the most rigid laws, yet always open for amplification. Preparation of soil, planting and general culture disclose rules, while the different varieties of tree, plant and vine afford the surest foundation for proper classification.

Lastly, to distribute the facts thus collected, verified and classified, is a vital object of an association. Were there to be no printed report of the proceedings, yet a great end is gained in the simple expansion of information, by which the knowledge and experience of the combined society become that of each member. The experience laboriously earned by individuals and generously contributed to the common fund is no longer of mere local importance; to the citizens of the state it is of the highest value; and it stands to the credit of the legislators of Missouri, in the eyes of all intelligent constituencies, that they afford the widest circulation to the proceedings of this association.

The influence of horticultural associations can hardly be overestimated; the individual they draw forth from his isolation, systematize and increase his knowledge, and prepare for his rightful place in the nation; the community they arouse to the importance of horticulture, to health and comfort, and elevate to a more correct appreciation of nature's simplicity and beauty. The situation of the horticulturist is in some respects a peculiar one; of necessity there is a degree of isolation; he lives apart from and rarely meets with his fellow laborers. His work is of such a nature that, while he is at all times in contact with the Creator's works of beauty, he has little communion with the noblest work of all—his fellow man. And yet, there is no one standing more in need of interchange of ideas and concert of action; the subjects practically embraced under the grand head of horticulture are so many and varied, that he may well give over the attempt to gain a general knowledge of all, and even in a few branches the individual horticulturist is often reduced to despair for the time. A series of bad years succeed one another; new diseases are bred in the air, strange insect enemies are developed, the winters are severe, the seasons are early, dry and cold, and late, wet and hot. The horticulturist encounters complete failure in every tree, in every plant and vine; he tries every known remedy, battles to his utmost against the insect legions, and gains nothing. If he be of indomitable perseverance, he may struggle on year after year in the hope that he may discover some relief. But where a harder case? Here it is that, by inducing united action among all sufferers, an association is essentially of use. Queries are at once proposed. Has such a disease ever been known before? Have like insects ever devoured bud, leaf and fruit? What are now all the bearing facts? Again, how may we

so cultivate as to mitigate the evils of early drought and late overgrowth? And then the universal question: if these misfortunes be inevitable, what laws of nature have been transgressed? And in every case the evils are alleviated and the remedies discovered, or the reason of failure scientifically demonstrated.

These associations draw out the individual from his seclusion; his sympathies are enlarged, and all his powers are elevated; he is no longer one single man working for the interest of one; he is "one of the many," and every thought of his mind and every movement of his body is consecrated to a great end. Not only for himself and his family, but for all he now works, and what might have become narrow selfishness now is transformed into the purest and highest devotion.

Again, these societies increase the knowledge of each member; his private experience is enlarged, from that of one locality and a few particular plants, to the experience derived from many lives of patient toil, to that from a whole state, perhaps from the United States, and we shall hail as an omen of great moment, when it can be added the horticulturist of the State of Missouri comes to the state horticultural association to exchange his own experience with that of the world.

Apart from the actual knowledge acquired by these associations there are valuable suggestions imparted from the oldest veteran whose success has long been the pride of his country down to the youngest neophyte. New ideas are suggested, and even through the failure of plans practical experiments are instigated by which the most significant discoveries are achieved. More insignificant things than the steam streaming from the spout of a tea kettle, or the fall of an apple, have lead to equally wonderful conclusions.

Besides the knowledge and suggestions developed, these associations exert a marked influence on the individual, as they arouse his ambition and pride; the best success is laid before him with the methods pursued, and instinctively there comes the thought, "may not that be bettered?" Directly the association appeals to the best energy and highest ambition of a member, when, for zeal in any department of knowledge, he is dignified with a post of honor; points have been raised on which further information is required, and he is intrusted with the serious charge of acquiring, developing and presenting all available facts. There is a principal ingrafted on our nature, by which in proportion as one forgets himself, and toils for others, his labor is not in vain; and thus it comes that the individual, under the direction of the association, and for the benefits of his fellows, is enabled to do that impossible to him working for himself.

As the last and highest influence, the individual is awakened to a consciousness of the dignity of his occupation, and thus prepared for assuming his rightful place in the nation, and yet more is thus elevated above the mere earthly to the full strength of Christian manhood.

Consider the simplest dignities of our profession. 1. It is innocent; no unmanly desire was ever stimulated, no evil passion ever aroused,

no low habit ever induced by such hallowed communion as ours; on the contrary, the will is ennobled, anger is allayed, and the life is purified. 2. It is useful negatively, as it keeps from evil, positively, as it does good. All efforts tend to unalloyed benefit, the gain of one is equally a gain to all; for every tree planted, for every vine tended, the world is so much richer, and man so much healthier and more comfortable. 3. It is "man-ennobling," as the first and greatest of all poets wrote of Pathia. Daily intercourse with the workings of nature brings a peculiar feeling. A man plants a seed, perhaps because he likes the fruit; as the little germ swells and starts, as the sun shines on the young plant, as the rain falls on it and the air feeds it, man cares for it as he can with spade and knife, and when he eats the fruit of that tree, there is more in his heart than mere gratification; together with profound gratitude there comes a sense of nearness to God, and of conjunction with Almighty plans. And the human is lifted toward the divine.

We shall not dwell on the testimony to the dignity of agriculture; we forbear to mention the great and wise whose lives have been living witnesses from the Roman emperor, retiring from the throne of a world-wide empire to take charge of a cabbage garden, down to our own Washington, resigning the presidential chair to devote his closing years to agricultural progress; but we present as a sentiment worthy our consideration his well-known words, "agriculture is the most healthful, most useful, most noble employment of man."

In view of the powerful influence exercised by every association, it becomes a question of vital importance to every earnest member, what are the duties? Without doubt the development of the utmost energy in the individual is the grand aim and the first duty. The maintenance of a high standard, and the exaction of accurate reports from all must insure progress; but to this end a society should offer facilities inaccessible to the individual. Books of reference should be collected, and instruments essential to the proper examination of special topics should be provided. In the future, every horticultural association will undertake experimental gardens, which under practical management will be an expression of the highest taste and most advanced experience in horticulture.

The greatest caution should be exercised that moderation prevail in all statements, that truth be guarded with jealous care from the slightest infringement; also that a spirit of sociality and brotherly love be maintained in all intercourse and discussion.

In conclusion, a sacred duty devolves on the members of every horticultural association. In every nation, in all time, history presents the agricultural element as the bulwark of a nation's liberty, as well as the support of a nation's prosperity. Let us, then, as of the fine arts, of agriculture cherish this precious trust; let it not pass sullied to future generations, but, true to the high mission, upholding the cause of liberty and equality of justice and truth, let us fulfill the holy duty we owe to God and our country.

R. S. Elliott: I had no idea of saying a word here to-night, but this state of Illinois is putting us in debt—a debt I am afraid we cannot discharge. I think that these gentlemen from the other side try how much they can add to this indebtedness. We cannot have listened to the beautiful eloquence of this young gentleman without feelings of gratification, and I move that we tender him our unqualified thanks.

Adopted with acclamation.

APPLES RESUMED.

Mr. Huggins: I ask as to the dominie.

Mr. Lear: My wife thinks this the dominie (sample).

Mr. Huggins: It is one of finest trees to grow in the nursery. In my locality it does not do well. It blossoms well in strings, like a string of onions. In coming to pick them, no perfect fruit remained. They rotted badly. Some of our neighboring fruit growers recommend it. It is a rapid upright grower, and has a look like the rambo, but not quite so flat.

Dr. Hull: When I purchased my present place I got four trees of the dominie. They bear well every year. I regard them among my most reliable trees. I would have recommended it in preference to any other. The trees are forty years old.

Jno. Huggins: These remarks are pleasing to me. They show the importance of always noting soil and location. There is so much difference between the prairie and the bluffs.

J. A. Pettingale would ask in regard to Ortley: Is it affected by the mildew? It always makes the apple imperfect.

Mr. Lear: Four or five years ago we had more than three-fourths of these varieties affected by this mildew. It was so with "red June." It takes place when the apple is quite small, and whenever these spots appear the apple ceases to grow.

Mr. Pettingale: My trees have been affected by this blight for the last three or four years. One-half of the crop is destroyed. Think it worse on prairie soil. Little difference in wet or dry. After two to three years they become almost worthless on this account.

J. Snedeker remarked upon varieties of soil and of trees: On prairie would not plant Newton pippin at all; on high ground it is good. Smith's cider, some one said, was liable to blight—have known it forty years, in Kentucky, Illinois, New York, Michigan. Had some trees set in a low, wet place, surrounded by forest, and it did blight a little for want of air, but in every other case it has done well. It keeps all winter, is as fair as Rome beauty, and is a little more profitable. Rome beauty does very well around me—one of the best varieties. Rarely keeps after December or January. It was called royal red, came from Tennessee to Indiana and Illinois. It came with a lot of seedlings from Bucks county, Penn.

Mr. Lear: It was sent out some twelve to fifteen years ago by Mr. Stewart, as the wine.

Jno. Huggins: I would like to call attention to the "sapson" or "sops of wine," a good apple, ripens forty miles north of this with the red June. Bears carriage better, is a little larger—have had it for twelve years. My family of seven children prefer it to any other apple at the season. It is so with my hired hands; and some of them, years after they have left me and got places of their own, on coming for trees to plant, have asked for some of those trees where the children always made a path. It bears more regularly than any other tree. If any one wishes to try it, I will send some scions.

Mr. Hilliard, Brighton, Illinois: Have cultivated it for twenty years. Most profitable apple in my whole collection; have fifty to sixty trees in bearing sixteen years; seldom fails. Received it from "prince," as summer pearmain. I find sapson is its true name. Bears much better than any other summer apple. Full medium size; not so red as winesap. Flesh with some red streaks, but this is not always the case.

Dr. Hull: Last year, when on a pomological committee, I asked a great many growers what was their best market apples in the summer varieties. They would describe several as very fine, but invariably ended by saying they had one they thought was much better than any of these—it was sapson. I think that all agree it is the best early apple. It is very firm and takes well to market. Some shake it from the trees and put them into the open wagon, and it is then in the best order of any summer variety.

Jno. Huggins: I exhibited some of the apples that had been bruised by a wagon three days before, and the bruises dried up without spreading to the rest of the apple.

Dr. Hull: I am of the opinion that this apple is not correctly named. I have seen this apple "east," and this is not the apple that is generally disseminated as the sapson.

Jno. Huggins: I have shown it to New Hampshire men, who recognized the apple. Mr. Kimbell identified it as such.

J. A. Pettingale: I got the scions from New Hampshire twenty-five years since. Brought them to Bunker Hill. At the time mine commenced fruiting, Mr. Huggins was selling it under the name of summer pearmain. I showed my apple to him and they were the same. It is a good shipping apple.

Mr. Hilliard: It sells from five to seven dollars a barrel. I shake the trees twice a week, barrel up and send to market. They don't show the bruises, and get into market in fine condition.

Mr. Snedeker: I have raised this apple twenty years. It is a good strong tree; healthy, and gives a good crop. I think you can sell the apples when people don't know what they are buying—looks sell any apple. I have not seven children, but my two children find some other trees better. When they get bruised the decay stops before it

can get through the skin. They ripen slowly in July and August. You can shake them from the tree safely. I used to sell the trees; now I have some compunction about it; but it is a fine, showy apple.

Mr. Lear has the same fruit under the name of pearmain. The skin is tough, but it is really a good apple.

Mr. Hilliard: Good judges will only call it second rate.

Adjourned.

SECOND DAY.

WEDNESDAY, 9th January, 1867.

The meeting was opened by prayer by the Rev. Dr. Colman.

The following letter from F. R. Elliott, Esq., was read:

CLEVELAND, 4th January, 1867.

DR. L. D. MORSE:

DEAR SIR: I notice your state horticultural society are soon again to meet. I wish I could attend, but it may not be. Nevertheless I shall be with the meeting in imagination, and shall read with a ravenous appetite the report of their sayings. There are one or two points on which I wish disputants would further enlighten learners like myself, and hope our good friend Husmann will be one to take the "measure from his light," and give us yet more of the benefit of it.

One item is: If surface roots are left to the grape in the vineyard, how deep will it do to break the soil? How deep at one foot from the vine? How deep at two feet from the vine? How deep at three feet therefrom? I have a little theory on this matter, combined with some practice had twenty odd years ago, and want more light.

Second: Have we any implement that is just the thing for working among vines with horse-power? If so, what is it? If not, what are the requisities for such an implement?

Third: I would like if each member of the society would prepare, privately, a list of such fruits as he considers no longer worth cultivating; these lists to be handed to the secretary to be collated for publication, something after this manner:

Name of fruit.	No. of records.	Whole No. in Convention.	Character of location.
Doctor.....	39	65	High or low.

This would show, without giving names, the proportion of the convention who regarded the doctor as a variety superseded by better

sorts. If votes are taken in convention, many men are so modest that they forget to speak—but if each is to give in a record, without his name appearing only to the secretary, I think a better result would attend, beside it would not occupy the time of the meeting.

Yours, truly,

F. R. ELLIOT.

The president thought this a valuable suggestion.

The secretary suggested that the suggestion be acted on, adding (as is here done) the character of location as high or low; and if this cannot be done at this session, let it be done in the interim, and it will be prepared as a report at next meeting.

Dr. Hull, from the committee on entomology, presented the following report:

MR. PRESIDENT: It is presumed to have been a leading object of the society, in appointing the committee on entomology, to limit their action to insects injurious or beneficial to horticulture.

Owing to the general failure of fruit the past season, we shall, therefore, defer an extended consideration of the subject.

One insect, however, the steel-blue flea beetle (haltica chalybea) appeared the past spring in certain localities in such vast numbers as to require some notice of his doings. Early in April, about the time of the swelling of the buds of the vine, this insect made his appearance in my grounds. At first I felt but little concern on account of his presence, as I instantly recognized him as an old acquintance, who would probably bury himself in a few of the fruit buds, eat up the fruit they might contain, and then disappear.

Judge of my surprise, then, when each succeeding day added to their numbers, and with the increasing warmth their voracity left me little to hope for in the way of grapes. On a large portion of the vineyard they continued their depredations until every fruit bud had been destroyed, and on those vines first attacked by them they kept the foliage cropped so close that, at the end of the season, out of three thousand two hundred vines, upward of six hundred were killed, and many others were much damaged.

In Harris' Insects Injurious to Vegetation I find the following description of this insect:

"Haltica chalybea of Illiger, or grapevine flea beetle, as it might be called on account of its habits, is found in almost all parts of the United States, on wild and cultivated grapevines, the buds and leaves of which it destroys. Though it has received the specific name of chalybea, meaning steel-blue, it is exceedingly variable in its color, specimens being often seen on the same vine of a dark purple, violet, Prussian blue, greenish blue and deep green color. The most common tint of the upper side is a glossy, deep, greenish blue; the under side is dark green, and the antennæ and feet are dull black. The body is oblong oval, and the hinder part of the thorax is marked with

a transverse furrow. It measures rather more than three-twentieths of an inch in length. In this part of the country these beetles begin to come out of their winter quarters toward the end of April, and continue to appear till the latter part of May. Soon after their first appearance they pair, and probably lay their eggs on the leaves of the vine, and perhaps on other plants also. A second brood of these beetles is found on the grapevines toward the end of July."

I have not had an opportunity to trace the history of these insects any further, and consequently their larvæ are unknown to me.

Mr. Harris quotes Mr. David Thomas, who says: "These brilliant insects were observed by him in the spring of 1831, in Cayuga county, New York, creeping on the vines, and destroying the buds by eating out the central succulent parts. * * * When disturbed, they jump rather than fly, and remain where they fall for a time without motion. During the same season, these beetles appeared in unusually great numbers in New Haven, Connecticut, and its vicinity, and the injury done by them was wholly unexampled. Some vines were entirely despoiled of their fruit buds, so as to be rendered, for the season, barren. * * * A good description of the larvæ, and a more full account of their habits, seasons and changes, are still wanted."

Dr. Hull then read a letter from Dr. B. D. Walsh, relative to certain insects.

Dr. Hull exhibited specimens of the curculio, the gouger sent by Prof. Walsh, and the insect that had recently began to commit depredations on apples. He thought it of the curculio family.

He asked Mr. Husmann if the ravages made in Mr. Poeschel's vineyard, alluded to in Mr. Husmann's report, was a brown or a steel-blue bug. I think I heard that Mr. Poeschel's vineyard was injured to the extent of several thousand dollars. There is no doubt the white thrip does much damage.

Mr. Husmann: The description of the rose bug is quite correct. I think that Mr. Poeschel's vineyard was not destroyed by an insect, but by late summer pruning. The white thrip had something to do with the bad health of the foliage. Has the white thrip become as destructive at Alton?

Dr. Hull: I have observed a number of vineyards and varieties and find large numbers of thrips on the thin-leaved varieties, like the Catawba, while the thick-leaved varieties, like the Concord, are exempt. The sucking of the juices of the thick-leaved varieties is attended with too much labor. In some of the old vineyards the Catawba, Delaware, and such varieties, suffer so much that they cannot ripen their fruit. Later in the season, they attack lateral leaves and young growth, and prevent the maturing of the fruit buds, and thus injure or destroy the crop of the next year: as it is a well-known fact the vine is at once perfecting the fruit of the one year and elaborating the fruit of the next. I believe we have a remedy in a strong decoction of tobacco and soap suds applied with a garden

syringe. In the case of my own vineyard, I hardly made a barrel of wine from thirty-five thousand vines.

The following communication was received and read:

St. Louis, January 9, 1867.

Hon. H. T. Mudd, *President State Horticultural Society:*

Dear Sir: Allow me through you, to extend an invitation to your society to visit and examine the interior of our "fruit house," No. 712 South Third street, on Thursday next, either by committee or in a body, at such hour on said day as may be most convenient.

Very respectfully,

S. B. Kellogg,
President St. Louis Fruit House Co.

Dr. Edwards moved that the thanks of this society be tendered to S. B. Kellogg for the invitation, and that the invitation be accepted and made a special order at half-past eleven o'clock, to-morrow. Adopted.

Rev. C. Peabody suggested that a committee would be better.

Mr. Kellogg: The whole society can come and see the structure, which is better than only a few, and we cannot open the doors to every visitor, but will make arrangements to meet this case, and a committee can be appointed to report.

Dr. Clagett: Many of the members would, doubtless, like to go.

The president appointed Rev. Charles Peabody, Dr. E. S. Hull and Prof. G. C. Swallow said committee.

The president suggested to Mr. Kellogg to name the varieties of fruit laid on the table of the society, so that they be classed with the other fruit.

Mr. S. B. Kellogg: Roman stem and bellflower, out of the fruit house three weeks; pippin, Pryor's red, winesap, genitan. Pears without name, by Wm. Storer, Illinois (Duchess d'Angoulême), Bartlett, and ——. A box Catawba grapes from George Husmann. Box of Concord grapes, Dr. Deyer.

The following communication was read:

St. Louis, January 9, 1867.

To the President of the State Horticultural Society:

Dear Sir: In behalf of the American wine company of this city I most cordially invite the members of your society to visit the wine house and vaults of this company, on Cass and Garrison avenues, at such time as may suit the convenience of the society during its present session.

Isaac Cook, *President.*

Dr. Clagett moved that the thanks of the society be tendered to

the American wine company, and the invitation accepted and made the special order for to-morrow at three P. M., and that a committee be appointed to report on the same. Adopted.

The president appointed Dr. Claggett, Messrs. E. R. Mason and George Husmann said committee.

Dr. Morse, from the committee on the secretary's report, presented the following:

The committee to whom was referred the secretary's report, respectfully submit the following: The first subject found in the report, which seems to require the action of the society, is the "wine question." The report says: "The views enunciated by your wine committee of last year, setting aside, as it did the conclusions arrived at by the society, and deliberately given out to the public by special resolution, has given rise to much discussion."

We have examined the report of the wine committee of last year, and do not find in it evidence of the correctness of the statement made by the secretary. The committee, as such, seems to have enunciated no views except simply to give their judgment in regard to the quality of the wines submitted to them. We think the secretary must have confounded the report of the wine committee with the views which were expressed in the discussions which followed. We therefore recommend that the secretary have permission to modify that portion of his report which seems to be a reflection upon the gentlemen composing that committee, not warranted by the facts.

The report further says, on this subject, that the object in bringing it up is "to reaffirm the position taken heretofore by the society, or at once to say that high position is found to be practically untenable."

We presume this refers to the resolution before mentioned. The only resolution which we have been able to find on the subject was adopted at the session of 1865, on page 371 of the report, first series, and is as follows:

"*Resolved*, That a permanent committee be created, to whom all wines, other than those made from the pure juice of the grape, shall be referred."

We recommend that this resolution be reaffirmed.

The real point which the secretary undoubtedly designed to bring up, is the question of gallizing. Following the report of the wine committee last year, Mr. Husmann stated in the course of discussion that his wine had been gallized. Two or three of the members of that wine committee had heard the same, directly or indirectly, from Mr. Husmann, before serving upon the committee. The majority of the committee, it is presumed, did not know it. The subject was not mentioned in committee. The wines were judged by the smell, taste, and sometimes by the scale, precisely as wine committees of this society had tested the wines in other years. How could they have done otherwise? Surely, they were expected to judge of the wines by their own senses, and not by what may have been told them.

Previous to the time under consideration, the subject of gallizing was unknown in the transactions of this society. The society had taken position strongly against sugared wines. The committee acted in accordance therewith, and with precedent. Gallizing was a new thing. The society had not taken a position on that point. We think there is a distinction between sugared wines and gallized wines. What the society meant by sugared wines previous to last year, was wines that contained sugar, and no new definition has been made. Gallized wines may not contain sugar. Wine is the fermented juice of the grape. Must is not wine. In gallizing, the sugar and water is added to the must. In the process of changing to wine, the sugar of the grape, as well as the added sugar, is changed by fermentation to alcohol, and the wine contains no sugar. If it is not all changed by fermentation, or if sugar be added after fermentation, as is frequently done, then the wine contains sugar, and has been called sugared wine. We are credibly informed that the wine committees previous to last year passed upon gallized wines without knowing it, and committees might have passed upon such wines until this time but for the frankness of Mr. Husmann. Gallized wine cannot be detected by the taste and smell with any degree of certainty.

In order to bring this subject properly before the society, we recommend the adoption of the following resolution:

Resolved, That this society disapproves of the practice of gallizing wine.

Laid on the table.

The next point which we notice in the report referred to us, is the statement that the preparation of last year's report was given to others, while the constitution makes it the duty of the secretary to prepare the proceedings for publication.

However unjust this action was toward the secretary, as well as contrary to the constitution, we are fully persuaded that the step was taken with the purest motives and in ignorance of the said requirement of the constitution. We are assured that no insult or discourtesy was intended.

We recommend that the constitution and by-laws be printed with the proceedings of the society this year, in order that the members may be better informed in regard to them.

We also recommend that the secretary be paid one hundred dollars for his services the last two years.

Very respectfully submitted.

L. D. MORSE,
E. S. HULL,
C. M. SAXTON,
Committee.

Dr. Spalding moved the adoption of the report, omitting the resolutions.

Dr. Deyer: Let us get the salary and the wine questions separate.

The secretary explained it was not with any intention of blaming the wine committee of last year, but of reviewing the entire action of the society on this question. The views were hurriedly put together.

Dr. Spalding: I moved the resolution separating the wines into two classes but not writing the resolution as I should have done, the word "pure" creates all the difficulty.

Mr. Husmann: Strike out the word "pure," if it means adding sugar before fermentation, as I am satisfied it cannot be distinguished. And how can any committee perform those duties?

Mr. Flagg: I shall vote for this amendment; it is necessary and due to ourselves. At the time this resolution was adopted we had a little difficulty about "gallizing wine." It was voted down. The society reverses this action when it votes for this amendment.

Mr. Barnabas Smith: It would be better to say we were wrong before, than to try to bolster up a false position. Gallizing was brought up and distinctly voted down. I recollect the course of Messrs. Flagg, Husmann and others. It will come out better to say we were wrong.

Mr. Husmann: The gentleman is wrong as to my denouncing gallizing at that time. I was on the wine committee at that time, and there were wines that had unfermented sugar in them rejected by the committee. I never denounced gallizing.

Mr. Smith: My recollection is the same as Mr. Flagg's.

Mr. Flagg: I did not refer to Mr. Husmann.

Mr. E. R. Mason: I recollect Mr. Husmann's position at that time. He did not denounce gallizing. Dr. Shroeder took the position that our wines should be sweet to please the palate; our wines were too sour. I took the ground that sugar would increase alcohol and only produce sweetness to a certain extent.

Mr. B. Smith: I recollect that Dr. Shroeder urged the use of grape sugar in the poor wines. This was the principal point, as I understood it at the time.

Mr. Husmann: As Mr. Smith calls attention to my views, Dr. Schroeder said it was to suit the American taste he made sweet wines. In Bloomington they may not be able to make wine without sugar. It was in regard to this tampering to a wrong taste. I did not take any objections to sugaring the wine before fermentation.

Mr. W. Glasgow: I don't like to see that word "pure" stricken out. We must have some landmark; would rather call wines made with sugar improved wines. They may have been very much improved. I think it necessary for the society to keep these landmarks. Some say there is a difficulty to distinguish wines that are sugared. The sugar disappears, and nothing but spirit remains. If you allow the use of sugar you must allow the use of other ingredients, and thus we open a door to all kinds of fictitious drinks. Some such wines may be smuggled in upon the committee; let them pronounce upon them as far as they are able.

Dr. Hull: In view of the fact of our conversion, we should rescind our former action.

Mr. Husmann: To place that amendment in its proper light, it was not with the attention of bringing the question of "gallizing" before the meeting. It was simply to try to prevent an impossibility—the attempting to separate the wines. There is no committee can tell which is pure and which is not.

Mr. Guye: I was one of that committee, and there was one sample of wine so "pure" it took light from a paper.

The resolution as amended was adopted.

The resolution "that this society disapproves of gallizing," etc., was laid on the table.

The resolution that the secretary be paid $100, was adopted.

Dr. Morse made some remarks upon the former action of the society in regard to preparing proceedings.

The resolution to have the constitution and by-laws printed with the proceedings was adopted.

Mr. Flagg moved that a committee of five be appointed to report one year from this upon the gallizing process. Adopted.

Mr. J. H. Tice read the following:

Whereas, the loss from damage done by insects to fruits, vegetables, grains, and grasses every year amounts to millions of dollars; and whereas, these injuries can only be counteracted by a knowledge of the nature, habits and mode of operation of the insects; therefore,

Resolved, That we recommend to horticulturists and cultivators generally the Practical Entomologist, published in Philadelphia, at fifty cents a year, and edited by Prof. B. W. Walsh, of Illinois, as the best publication in the country to impart the information necessary to wage a successful warfare against their insect enemies. Adopted.

Dr. Edwards called attention to some very fine large specimens of the Chinese quince, grown in Louisiana, and presented to him by a lady in this city; tree about seven years coming into bearing; small tree. There is no doubt it will grow here. Makes a rich preserve.

Mr. J. H. Tice: A lady sent me some, grown near Baton Rouge, larger than these.

Dr. Edwards: I think Downing had the tree twenty years ago. Nothing has been said about it since. I have the promise of some scions, and will distribute them to test. As it is important to cook fruit correctly, I have had a vessel made upon the principle of the "water bath," so that fruit, etc., cannot be burned in the cooking. A sample was exhibited.

AFTERNOON SESSION.

The society met. The election of officers being in order, the president appointed Messrs. Riehl and Guye tellers, and the following were elected officers for 1867:

President—H. T. Mudd, Kirkwood.

Vice Presidents.—George Husmann, Herman; O. H. P. Lear, Hannibal; Dr. B. F. Edwards, St. Louis; B. Smith, Cuba; Thos. Walker, Jefferson county.

Corresponding Secretary—C. M. Saxton, St. Louis.

Recording Secretary—William Muir, Fox Creek postoffice, St. Lous county.

Treasurer—John H. Tice, St. Louis.

Mr. W. C. Flagg presented a partial report on vineyards. Not having been able to visit them in person, he had obtained reports from several gentlemen engaged in the culture of the vine, which he would submit.

Mr. McPike, of the Alton vineyard, says:

This vineyard is situated in a central locality in the city of Alton, high and sightly. The whole grounds comprise twenty-four acres, upon which there is a good variety of fruit of all kinds. A portion of the vineyard was planted in 1865 and 1866. In 1863 the ground was broken from twelve to twenty inches deep in some parts, and terraced with a large side-hill plow in others, holes dug, grape roots planted early and deep; cultivated carefully and clean during 1863; in the fall (November) were cut close to the ground; in 1864 the vines were very carefully cultivated, growing two canes only; no grass permitted to grow near or shade to reach a vine. The hills were 6x6 feet, the cultivator being used as in corn. In November, 1864, were pruned for fruit—one cane cut to three eyes, the other to eight or nine eyes, and were laid down and partially covered with earth. These vines were trained in the spring of 1865, some in bow (three-fourths of a perfect circle), others on arms of an angle of 45 degrees, and still others on arms horizontal; were well cultivated, pinched very early before bloom, and carefully suckered. This was a very wet season here, the ground becoming sour at the time the grapes were full size. Distributed lime under each vine, for the purpose of drying out and sweetening. The varieties were Concord, Catawba, Delaware, Diana, Clinton, Hartford and Isabella, with few specimens of other varieties. A full crop of perfectly and evenly ripened fruit was the result on all varieties without an exception. During the season the leaf roller made his appearance, and was killed by hand. The various rots and mildew might be found on careful examination on the Catawba alone, but when fall came the fruit was perfectly ripe, and there were leaves to spare on that variety.

Pruned the vines, taking off the fruiting stock, cutting back one of the three new canes grown that year, to three or four eyes, and the other two canes to nine eyes each; cover up as before in November. The spring of 1866 found them in good order. Trained as before, some on wires, others on single stakes; treated exactly as stated; finding in the fall a heavy crop of all kinds; adding to the variety the Creveling, Norton's Virginia seedling, Anna and North

Carolina seedling. The disposition in this vineyard is to fruit as much as possible on the lateral or limb with the rapid growers. In doing this it is necessary to pinch off the top of the new canes as soon as they are about five feet high, which, stopping the growth, starts the limbs out, upon which it is believed the fruit eye better developes. Each year has added to the vineyard, the fruiting portion of which should produce in 1867 from six to eight tons of fruit. The vines were pruned in last November, laid down and are now snugly covered for winter. While other vineyards made from a partial to a whole failure, this one had a perfect and a beautiful crop. Many plain points are urged to the end of success, mostly as indicated in the above treatment, but very much of failure is attributed to cold and not a little to neglect and carelessness.

Mr. Jordan, of St. Louis, says:

I planted five hundred Concord in the spring of 1864; trained to a stake and cut the first season. They would average about eight feet of growth. Spring of 1865 layered 450 of them, and fruited the other 50; got about 300 pounds of fruit and 5000 fine layers and two strong canes for the next year's fruiting. In the spring of 1866 I put up a trellis of oak stakes, 8½ feet long and 1½ feet in the ground; slanted the top to the north three feet; put in one stake to every two vines; put four lines of wire on the top side, lower line two feet from the bottom, the other 20 inches apart; fastened the wire to the stakes with a No. 8 wrought nail driven into the stake bent over the wire. From these 500 Concord I cut 11,000 pounds—an average of 22 pounds to the vine. This season from one vine I cut 96 bunches, which weighed 23 pounds; from another 65 bunches, weighing 30½ pounds. I pinch the fruit bearing laterals as soon as I can after the third bunch of fruit has shown itself.

My present opinion, subject to correction by further experience, is, success with the Concord depends on good healthy vines planted about 8 inches in well plowed ground. Plow at least 12 inches, and the deeper the better. Clean culture—never growing any other crop in the vineyard, not so much as a crop of weeds. Always grow enough of good, well ripened wood for the next year's fruiting, and no more. Leave the laterals to grow on the new canes about one foot long, and then pinch them, and on the fruit bearing vine pinch the lateral as soon as the third bunch of fruit has set and a leaf opened; then rub off the first bunch of fruit, and leave the second and third to mature. This work, I think, is the most important (with the exception of gathering the fruit when it is ripe and killing the birds that rob the vines) of any the vintner has to do, for a very few days' neglect will often blast a large proportion of his crop.

Prune with thumb and finger; never use a knife in summer pruning. We should direct the growth, not cut it away.

OBSERVATIONS IN THEODORE ENGELMANN'S VINEYARD, ST. CLAIR COUNTY, ILLINOIS, 1866.

The lowest temperature in the winter of 1865 and 1866 was 17° R., or 6° F.; in more exposed locations it was some degrees lower. Grapevines suffered some, but no material injury from this cold weather; Norton's Virginia more than Catawba; Concord, Clinton and Taylor were not affected by it; Herbemont was bent to the ground and covered a few inches deep with earth, which afforded ample protection. Spring came in late, and was dry and cool. The nights remained cool until late in May. The development of the grapevine, like that of the vegetable world generally, was slow and backward. The first blossoms to gladden the vine dresser's heart were those of the Clinton, May 18. The Concord soon followed—May 21; then came the Catawba and Taylor, May 23. The Virginia and Herbemont lingered behind till June 10. The processes of blossoming and impregnation progressed slowly and irregularly, yet the newly set fruit remained free of mildew; possibly in consequence of the continuance of cool and dry weather.

On the 22d of June, while the atmosphere was warm and sultry, and thunderstorms in all points of the compass, with sparse local showers of rain, I observed the first signs of rot on the Catawba and Concord. The disease did not make much progress, but soon disappeared, until the 14th of July, when it reappeared during a similar state of weather.

It affected Concord and Catawba equally, and continued its ravages until the 22d of July, when a change in the weather took place, and the malady disappeared after it had destroyed about one-tenth of the fruit. From early spring until the last days of August, my vineyard was kept in a perfect state of cultivation; after the heavy rains, which set in on the last day of the month, I suffered the weeds to grow.

CONCORD.

I for one do not subscribe to the list of admirers of this grape; for the table it is third rate, inferior to the Catawba; for wine it is still more so; but it is more showy, more healthy and more productive, and if I had the assurance that I could readily sell my wine for and during the next ten years at one dollar per gallon, I would engage largely in the cultivation of this grape.

In the latter part of August the fruit was sweet and ripe enough for eating; it was healthy and the berries hung firm to their stems; I forgot my antipathy against this grape and viewed with satisfaction and pride the large clusters of tempting fruit peeping out from beneath the bright green foliage. I concluded to delay the vintage until the grapes attained their highest perfection; there was no apparent reason to be in a hurry; yet on the last day of August it commenced raining and continued to rain almost daily until the 10th of Septem-

ber. During the rainy spell I observed that the skins of the berries were bursting open and the pulp dropping to the ground. There was hardly a bunch but was more or less affected in this way, and to escape serious loss as well on account of the dropping off as of the souring of the affected berries, it became advisable to proceed to harvesting. This was done on the 12th and 13th of September. The berries were very large and juicy—I ought to say swollen and overcharged with fluid on account of the excess of moisture in the earth and in the atmosphere—and they yielded a quantity of must beyond my highest expectation, but it was deficient in quality, watery and insipid. Ochsles' must scales, which indicate only seventy-two degrees, equal to 14.4 per cent. of sugar, according to Babo's tables, or 16.1 per cent. according to Gall's corrected tables, would not weigh my must. This proves to me that it contained less than 14.4 or 16.1 per cent. of saccharine matter, and that, to produce good wine, it became necessary to increase the per centage of sugar in the must, by supplying upon scientific principles what nature had failed to perform. The process is very simple: to every twelve gallons of must, equal to ninety-six pounds, I added five pounds of sugar, thereby increasing the saccharine contents five per cent.

In former years I had the berries separated from the stems, had them mashed and transferred to the fermenting tubs, where, to every three gallons of mashed grapes, I added two gallons of water containing eighteen or twenty per cent. of sugar. After fermentation, when the young wine became clear, generally at the expiration of four or six weeks, I separated it from the husks. By this process I doubled the quantity of my wine and obtained a dark, claret colored wine. This year I adopted a different proceeding: the bunches as they came from the vineyard were mashed between rollers, and the pomace at once transferred to the press, and the juice separated from the husks and put in casks for fermentation without any addition of sugarwater, except the five per cent. of sugar as above stated. I have done this, not because I expect to obtain a better quality of wine, but rather in submission to a popular, widely-spread prejudice against wine which has been treated according to scientific principles, or, as it is generally styled, against gallized wines.

The Concord grape, more than any other grape I know of, admits of or rather incites such a treatment according to Gall's doctrine, and the wine will be improved by it.

The peculiar aroma or flavor of that grape, if well extracted from it and communicated to the wine, predominates and becomes, to my taste and to the taste of many good judges of wine, offensive.

We must have two remedies against it: one is to dilute the excess of flavor, as I have done in former years; the other, to leave part of it unextracted with the husks, the treatment which I have adopted the present year. The best Concord wine, according to my judgment, which I ever tasted, was treated according to the former method. But

I am bound to sell my wine, and therefore find it necessary to consult in its preparation the wishes and even prejudices of the consumers. The demand for native wines has diminished of late considerably, and their sale rendered difficult; and, although other causes may, in part, account for this, one of them, not to be overlooked, will be found in the prejudice which has been created against them by the public discussion of the propriety of gallizing our wine, and which has furnished a weapon to the hands of the importers of foreign wines, which they have wielded and still wield with great effect against the use of our native produce. I am willing to perform my part in fighting this prejudice, but I cannot keep my wine on hand until the victory is achieved. At the same time we ought not to close our eyes to the fact that large quantities of native wine of very inferior quality have been brought into market, which evidently were made by misapplication of Gall's teachings, as an indisputable proof that it requires a certain amount of skill and information to apply them correctly, and that this method of improving the wine ought not to be recommended for general and indiscriminate adoption.

CLINTON.

This grape appears to be well pleased with the location here, and with the treatment it receives. It grows luxuriantly, and is free from disease. On the 2d day of October the fruit was gathered, the berries separated from the stems mashed, and put in the fermenting tub, where they remained until the perceptible fermentation ceased; which took place on the fourth day, when the juice was separated from the husks. I obtained a dark claret colored wine, which very soon became clear and transparent, but with a strong flavor of the well-known mild winter grape. I do not know whether it can be mixed with other wines with impunity. In its present condition it is unpalatable. I must say, however, that I noticed, in my vineyard, two distinct kinds of this grape, perfectly alike in growth, foliage, and exterior appearance, but very distinct in taste. The fruit of one is sweet and pleasant, of the other like that of the winter grape. The latter is marked for extermination.

NORTON'S VIRGINIA.

This noble grape, although considered perfectly hardy, has not escaped, unhurt, the inclemency of last winter. A few of the vines were killed, more of them failed to set fruit, many had but little of it, while others in close proximity were well loaded with fine bunches. They were gathered on the 3d of October, mashed and put in the fermenting tub, where they remained three weeks; fermentation at the expiration of that time had entirely ceased, and the young wine was nearly clear when I drew it off from the husks. I obtained sixty gallons from about one-third of an acre, from which last year I had made one hundred and

twenty gallons. The wine is already perfectly clear and transparent, and its quality promises to compensate for the falling off in quantity. In the year before, vintage 1865, I separated the berries from the stems, and left the must on the skins in the fermenting tub until Christmas. This wine would not become clear, but remained somewhat turbid during all last summer. The cause of it I believe I can detect, both in the separation of the berries from the stems before fermentation, and in the delay until midwinter, ere the young wine was pressed off and separated from the husks. The acid of the stems (tannin) is if not a necessary at least a very useful agent to expedite the clearing of the wine, and in separating the wine from the husks (skins and seeds). Ferment was extracted by the force of the press, which, on account of the cold winter, remained suspended in the wine until the warm season commenced, and made itself felt in my cellar.

After I had drawn off the sixty gallons of wine, as above stated, I replaced them in the fermenting tub with fifty gallons of water, impregnated with twenty per cent. of sugar. Fermentation set in at once, and after it had done its work I mixed the second product with the inferior quality of the Catawba wine, although I have very good reasons to believe that it would have made a very good wine by itself. I have one acre of Virginia vines, now in their third year after planting. They were laid in the ground to raise layers. Many of them had fruit set and promised a fine crop. The heavy rains in September destroyed it almost entirely by beating it in the ground and washing earth over it. I raised 12,000 layers of good quality, in this vineyard, which will to some extent compensate for loss of fruit.

CATAWBA.

Whenever and wherever the Catawba remains free from disease, then and there it is the most desirable grape, equally excellent for the table and for wine. Unfortunately these favored spots and seasons are few and far between. It has not escaped unscathed in the past season, but the ravages of the diseases, which this grape with many others is heir to, were not so destructive as in many a former year. The most disastrous was the leaf blight, which has impaired the quality of the fruit and of the wine made of it. It appeared in the latter part of August, during the drought, and during the wet and stormy weather which followed in September. Nearly all the leaves dropped off and left the fruit hanging on the naked vines. The development and ripening of the fruit was thereby considerably impaired and delayed. I commenced harvesting on the 8th of October, and continued it until the 20th, favored all the time with the most delightful weather. We gathered the best bunches first, leaving behind those which were not perfectly ripe or were injured by disease. They were mashed between rollers and put in large tubs, where they remained until the next day, when they were transferred to the press and the juice extracted. To the eye and to the taste the berries appeared fully ripe and sweet, and I

was sadly surprised when I found that the must did not weigh more, on Oechsle's scales, than seventy-four degrees, equal to 15 or 16·6 per cent. of sugar; to obtain good wine, the must ought to contain at least 18 per cent. of sugar. I added, therefore, to the must two per cent. of sugar, that is, two pounds of sugar to every twelve gallons of must. Repeated tests, however, soon showed that the saccharine contents of the must increased from day to day, so that on the last day of the vintage the scales denoted eighty-seven degrees, which of itself is sufficient to make valuable wine. I reduced the additions of sugar in quantity in the same proportion as the quality of the must improved; at the same time I noticed a falling off in the quantity of juice in the grapes, which will account for the rapid improvement of the quality of the must. When we commenced gathering the grapes, it being soon after a heavy rain, the berries were overcharged with juice, the watery ingredients of which evaporated gradually under the drying influence of the warm October sun.

By this first gathering I obtained 1,750 gallons of must from six acres of vineyard. The grapes which we had passed by as not fully ripe or not perfectly sound were now brought in; to them were added all the grapes from other varieties of vines, which we had left behind as not sufficiently ripe or otherwise damaged, and the whole of it was subject to a treatment in strict accordance with Dr. Gall's doctrine. It yielded 1,200 gallons of must, which will make a fair wine.

HERBEMONT.

This grape justifies the high praise which is accorded to it in other localities, where it has been thoroughly tested. It is not free from disease; it is liable to mildew and rot, not to the blight; it retains its luxurious green foliage and vitality until frost sets in, and is able, if not to withstand the deleterious influences of the climate, at least to counteract them and to recover from their effects. I have only a few dozen vines in bearing age, and this is the first season I made wine of them. On the 13th day of October, to save the fruit from the ravages of the birds, the grapes were gathered, separated from the stems, mashed, and left in that condition a few days, until fermentation had made considerable progress. I have done this with the intention of securing a deeper color to the wine. When the juice was separated from the husks it was very sweet and pleasant to the taste, promising a superior article of wine; but put in a keg, fermentation did not set in again sufficiently strong to clear it. It is at this date still turbid and rather unpleasant to the taste; the cause of it may be the interruption of the fermentation at the time the juice was pressed off from the husks, or it may be a deficiency of ferment in the grape. The latter idea presents itself to my mind from a recollection that none of the samples of Herbemont wine which I have seen were "flacker." I must be excused for the use of this word, because I know none corresponding to it in the English language.

In Europe it is well known that the must of some varieties of grape is deficient in ferment, and it is either mixed with the must of other grapes, which have a surplus of it, or ferment is artificially supplied.

CONCLUSION.

The Catawba is the only grape which has had a full and fair trial in St. Clair county, and it cannot be said that it lost by it. I know of two vineyards only in which the vines have been grubbed up to make room for cabbage heads and potatoes. The oldest vineyard—planted in 1846—is yet in existence, and yields regular crops annually under the management of its original owner, Mr. Val. Huff, a practical vine-dresser; and although they differ widely every year in quantity and quality, still they reward Mr. Huff for the labor bestowed upon them, and he wants no other vine. The success which Mr. Huff's vineyard promised in the first few years after it had come into bearing, called a number of other vineyards into existence, which, however, mostly, for a number of years, were more a source of disappointment and loss to their respective owners than of pleasure and profit. Disease heretofore not known or not noticed on the vines, made their appearance, and the crops failed in whole or part from year to year. This put a stop on all further planting of vineyards, and the lively interest felt in the cultivation of the grape faded away and slumbered for many years, until the introduction of the Concord, two or three years ago, revived it. This grapevine, a luxurious grower, healthy, productive, with large, showy bunches of fruit, was destined to bring new life and energy in grape culture; it has been extensively planted, and we will soon have plenty of Concord grapes and Concord wine in St. Clair county. It is natural that persons who engage in the cultivation of the grapes without prior experience select the more showy in all nursery catalogues, sky-high praised Concord, in preference to the more modest, but much superior Norton's Virginia, but even experienced vine-growers, who have a proper estimate of the value of superiority, hesitate to plant Virginia on account of the partial failure of that grape in the past season, and with them it is a serious question what varieties of grapevines to select for new plantations. Herbemont, Taylor, and Rulander are highly spoken of and recommended; also, of late, Ives' seedling, Rogers' hybrids, Cynthiana, and many others; but they have either not been sufficiently tested as to health and productiveness, or as to the quality of the wine which may be expected from them, or their price is as yet too high to warrant extensive planting. I have now in a vineyard of ten acres, eight of them in bearing, and I intend to add five more next spring, the ground being in course of preparation. I have not yet made up my mind which varieties to plant, but shall select, in all probability, Herbemont, Norton's Virginia, and Taylor.

Colonel Hecker, Lebanon, Illinois, says: When I settled in this

wide prairie, seventeen years ago, I was determined to experiment with grapes and wine raising. Most people laughed at the idea of planting vines on a level prairie; they clung to the old idea, "vineyards are only possible on hillsides and mountain tops." I had seen, not only in France, but in different places in Southern Europe, and even on the banks of the Rhine (the celebrated —— and Liebfrauen's milch) that excellent wine was raised on the plains, and that the hills or lower mountains are not only planted with vines, for the reason that the heat is increased there, by the reflection of the rays of the sun, but because the land so situated was not fit for any other purpose or would not pay so well.

Before I planted the first grapevine I closely observed the wild native grape of our forests, its habits, its diseases, and came thus to the conclusion that, where the wild grape succeeds well and brings eatable fruit, there must grow the tamed wildling (excuse this new word not to be found in Walker or Webster), and the only questions would be—What varieties will do best? As we now, here in our section of the valley of the Mississippi, have, during the months of June, July, August and September, an average heat of 76° to 77°, we range with the best wine growing parts of France and northern Italy, and if we plant native varieties which can stand our winters, we can produce wines equal to the best European wines; and can produce in our country the article we are paying for between five and six millions a year to foreign countries; and now, after over fifteen years' experience, I come to this result: "That the grape can be raised with equal (if not better) success in the prairies as on the hillsides or mountains," and wine and grapes of the prairies are in different localities finer in aroma, free from that "earthy taste," as it is called in Germany. I furthermore found out that the vines and vineyards will suffer less from diseases if the vines are planted so that the northern and southern winds can, unimpeded, pass or blow through. This is of the greatest importance in the seasons when the rot sets in; that is, at the time of the hardening or ripening of the seed.

I raised Catawba grapes every year, and never saw a total failure except on the place where the passage of the wind from north to northwest was excluded by a barn. We do not need here an increased heat in the summer months, produced by artificial means or chosen situations, to raise grapes and good wine. The average of 75° to 77° is enough, and I observed that vineyards planted on the southside of a hill, sheltered from the northern wind, suffered immensely from mildew and rot, while those with a northern exposure were not affected in the smallest degree. There have been planted in the last three years in this neighborhood, within the compass of five miles, between forty and fifty acres; others will be planted in the spring, and I am not so happy as to be a prophet, but I dare to say that in twenty-five years you will find in every farmer's house of this section of our state, a glass of pure, healthy wine, and the "whisky brokers" will then be as rare birds as prairie chickens.

In preparing the soil, I am utterly opposed to the system of digging and spading, and reversing the soil, with heavy expense, three feet deep. It would take too much room to expose, in full length, the disadvantages. I tried the old fogy digging with half an acre, and will never do it again; this half acre suffered more from disease than any other part of my vineyard. I recommend plowing fifteen to eighteen inches deep, not more; take a good strong plow and four horses. Set the plow to the proper depth of eight to ten inches, let another plow follow in the same furrow, plow subsoil to loosen the ground below, harrow it fine crosswise, and it is ready for planting. I prefer fall planting.

The vineyard fruits a year sooner and the plants grow easier. Prepare your land as above described, so that the loosened soil will be warmed thoroughly. I begin planting after the leaves have dropped off the vines, and continue till hard frost sets in—say the end of November (in this latitude). Set the plants in the well-known way and proper depth; cover slightly with fine earth; put some straw, litter or leaves on the top. A clod of earth will prevent the leaves blowing off. In spring, when the danger of frost is over, spread the leaves or straw around the plant, uncover the plant, so that the uppermost bud or eye can easily start. The spreading of the straw around the plant has the great advantage of mulching; it keeps off the weeds as well as the hoe of a careless "hand."

To propagate new or costly sorts, and for experimenting with these new varieties, as well as with slow growers, and shy bearers and seedlings, I can recommend grafting on strong old stocks. Graft as early as possible in the fall, end of February or early in March. Grafting after the 20th of March will be less successful. Cover those scions with litter or straw till the danger of frosts is over. Graft below the earth, in the root of the stock; fill it up with fine mellow earth, so that only the uppermost bud or eye is left free. Cover the cut of the scion with grafting-wax, to prevent drying out. Remove carefully all suckers of the old stock. Do not despair if the scion does not show any scions of like. I had some grafted in the first days of March. They looked dead in the first week of June; they then broke forth and grew so rapidly, as if they would make up the lost time.

I grafted in wild stocks (transplanted from the woods, after they had made good roots in the vineyard, in the second year) poor growers that were weak and feeble, and was astonished at the result. I have Rebecca grafted this way in March, 1865; the present year, 1866, the main vine (the scion of 1865) is as thick as a man's thumb.

A neighbor asked me how I came to the idea that the poor growers would grow vigorously when grafted on strong wild stocks? "Well, neighbor," said I, "we often see a weak child of weak parents grow and become a stout, heavy lad, because the baby was nursed by a stout mountaineer's wife."

As to the varieties to be recommended for general cultivation,

these here, Concord, Norton's Virginia seedling, Herbemont (must be covered in winter, but yields immensely), Clinton, Hartford prolific, Ives' seedling, Roger's Hybrid No. 1, Taylor or Bullitt (this small grape will be one day the "Riesling" of the west).

There are a great many more varieties of equal, even of greater merit, but we have not yet sufficient experience; and some of them are sold at such prices that it is not everybody will make the expense.

In conclusion, let me say, in regard to pruning—so far as vineyards in the soil of the prairies, where the humus very often extends from eighteen inches to three feet deep, are concerned—I am opposed to too much pruning, pinching, breaking out. "Art must imitate nature." If you wish it, I will give you my way of pruning in another letter, as I fear this will be too long for your patience.

Yours, truly,

FR. HECKER.

Mr. N. W. Bliss, Warsaw, Hancock county, Illinois, writes:

Of grapes, the Catawba leads the van, having been peculiarly successful here; it is more highly esteemed and more extensively planted than any other variety. Its must weighed 87° at Mr. Rander's vineyard this fall. What with bad seasons and worse plants, of the single eye order, the planters of the Delaware have met with such poor success as to prevent any extensive attempts at its culture here for years to come. Of all the vines of this variety, say thirty thousand to forty thousand, that have been planted in the county during the past three years, not ten per cent. are alive to day; and of those planted in the spring of 1865, not one per cent. are living. My partner and myself have between one and two thousand dollars permanently invested in an experiment of planting Delaware grape roots.

The experience of each locality in grape culture, as to variety of grape to plant, distances of vines apart, and modes of training, trimming and culture, is worth more to that locality than the experience of all other places combined; and the bold assurances of those interested parties who assert that this, that or the other grape is the best for all localities from Canada to Texas, whether it be Anna, Delaware or Iona, will soon be held at what they are worth—that is, at no value whatever.

The Concord does well here, and all unprejudiced vine growers admire the moral courage of the "Greely prize" committee, in awarding the $100 prize to this reliable and valuable variety in the face of the lofty pretensions of the many new and untested varieties, that are praised and recommended with so much zeal and so little discretion by those who expect to make money by their sale. The Concord makes a good wine here. Its must, from grapes gathered September 20th, in Dr. Warner's vineyard, from the lower wire (six inches to one foot from the ground), weighed sixty-six degrees. That from the second wire (three to four feet from the ground) weighed

seventy-six degrees, and that from the top wire (five to six feet from the ground), seventy-eight degrees. This result is an instance to the contrary of the old theory, "the nearer the ground the heavier the must."

I do not care, at this time, to discuss the value and necessity of wide planting and high trellis training in this climate, and still more in that of Cincinnati and St. Louis, but will say it is my belief that the grape derives more of its valuable proprieties from a proper degree of heat and ventilation than it does from the soil; and wherever the heat and moisture of the climate is as great as it is here, wide planting and high training are not only beneficial but absolutely necessary. On October 12, the grapes off these same Concord vines in Dr. Warner's vineyard, gathered from all the wires and pressed together, yielded a must averaging eighty-two degrees. I give dates of gathering, varieties and weight of must, at Golden Bluff vineyards of A. H. and Geo. B. Worthen, as follows:

Date.	Varieties.	Degree.
Oct. 1	Delaware	100
2	Concord	83
	Clinton	96
	Taylor's Bullitt	90
	Oporto	73
3	Catawba	83
	Isabella	72
15	Catawba	85
19	Catawba	86

In thirteen townships in Hancock county, Ill., the total number of vines planted is 748,650.

Dr. Clagett thought it important to discuss "the preparation of the ground for grape planting." Some want deep planting. Some think that they follow the indications of nature, as given by the wild vines, in adopting shallow planting. This idea of the teachings of the wild vine loses much of its force from the fact that what it lacks in depth of soil it makes up in superficies. In planting, along with the proper elements in the soil, we want light, heat, moisture, shade by mulching. We want to test this matter practically. I propose this season to take a piece of land, divide it into three portions, and trench plow a portion; trench with the spade and underdrain another piece, and prepare the soil of the other piece, and plant in the usual mode by making holes, and see which portion in the end will be most profitable.

J. M. Jordan: The subject of deep preparation is not so much the question as deep planting. The trouble in trenching is the cost. In

regard to deep planting there is great difference of opinion. I believe in shallow planting. It throws the light, air, heat, and moisture from the elements to those portions of the plant that require it. Perhaps about ten inches is the best depth.

Mr. Treebue had some experience in the preparation of a vineyard. Fall before last, broke up ten acres. Subsoiled one acre with the spade, two and half inches deep. Drained some with plank and some with brush. With two men, six oxen and three mules, I broke about three-quarters of an acre, fourteen to sixteen inches deep, a day, at a cost of fourteen to sixteen dollars per acre. Trenching with the spade cost about two hundred dollars per acre. Some I trenched four feet and thoroughly underdrained; in this I planted the most valuable varieties, and I found the deepest preparation produced the best growth. Adirondac made a most remarkable growth; it made two canes fifteen feet each.

Dr. Clagett: A gentleman telling me his experience in shallow planting, ended by taking up his vines and planting deeper, with the most satisfactory results.

E. A. Riehl: It seems to me that the question is got up wrong. Whether we plant deep or shallow, let the ground remain in its natural condition, or turn it upside down, depends upon the subsoil. At Alton we have a subsoil about as good as the top. In such soil you can hardly get paid for the trouble. Here, in this county, you can find a subsoil in which you can dig a cistern twelve feet deep, and with merely building with rock it will hold water. In such soil you can trench it and it will be worse than before. I plant eight to ten inches deep; below this, in retentive soils, the roots get injured. We have prepared the ground ten to fourteen inches by two plowings.

Dr. Long: Has several varieties of grape. Does not plant deep. Has got vines from members of this society, and did not set them as deep as they originally grew in propogating them. I planted Norton deep and they grew slowly. Plowed and planted about twelve inches deep and they grew well. The depth necessary depends upon the soil. This is seen in the difference between Dr. Hull's and Mr. Starr's soil and mine. In soil mixed with that light sand, you will find vines with their roots away down deep. Upon stiff clay they run more out. These differences in the soil indicate the preparation and planting. Does Mr. Jordan ridge his land for grapes, when level?

Mr. Snedeker: In regard to cultivating stiff clay soils, by all means cultivate deeply. I am not of Mr. Riehl's opinion, that it will bake down and be harder than before, if it is done in the right time. Plow deep in dry soil. This mode of trenching—eighteen inches and two feet deep, and laying the subsoil on the top—is not good culture, unless it lie upon the top to be enriched for a year two. I have a subsoil attachment to a common plow, that in ground not too hard will plow twelve to fifteen inches deep. If you have not this, take two plows, and you can, with a lifter, stir the soil twenty inches deep.

This avoids the necessity of throwing the subsoil to the top. In a stiff clay it is the best way of preparing the soil for trees or grapes.

Mr. Watson, Richmond, Missouri: In 1862 I prepared a small piece of ground by turning the soil upside down to the depth of three feet. Some I prepared two feet, some eighteen inches. My vines were the Norton, Concord, Catawba, Delaware and others. Next row I planted Creveling, Diana and others. Where the soil was prepared three feet the vines grew finely—rather too much at first. They still grow and bear well, all except Diana. I plant fifteen to eighteen inches deep. My soil is a good loam, with clay subsoil, also a little lime, on the north side of Missouri river.

Mr. Riehl: If there is natural drainage I doubt if you get paid for your trouble in trenching. Brickmakers turn up the clay to make it tougher, to make brick. There are two characters in the roots of grape vine: one goes deep in search of water; the other remains on the surface in search of food.

J. S. Mahan: In central Illinois our soil is about eighteen inches deep, then comes hard pan, about eight inches deep; perhaps this would be regarded the most unfavorable soil for the grape. We have planted at least 22,000 vines, and are preparing large wine cellars, and expect to get them full. We prepare the soil mostly with the plow; don't work through the hard pan; plow the middles together so as to leave a slight ridge. This leaves a small furrow for surface drainage; plant layers about two inches deep. The vines grow well. Mr. John Betts is about the most successful grower. He has made good wine, and sells it at three to four dollars per gallon. Our most extensive growers have given up the Catawba. We grow Concord, Delaware, Hartford, Clinton and some others. We do not subsoil. Vines do well on our soil, when prepared much as for corn.

WEDNESDAY EVENING.

Society met at seven o'clock.

The president announced the following committees:

On Gallizing—W. C. Flagg, George Husmann, Dr. E. S. Hull, Dr L. D. Morse, Louis Wolff.

Fruits on the Table—George Husmann, Rev. Charles Peabody, J. A. Pettingale, T. W. Guye, Isaac Snedeker, Wm. Stark, August Starr, Rev. J. J. Colman.

Wines—Dr. C. W. Spalding, William Muir, John Huggins, E. A. Treebue, Adolph Kehr, Dr. Weigel, W. C. Flagg, Isidor Bush, Dr. B. F. Edwards, O. A. A. Gardner, J. R. Allen, Professor G. C. Swallow, Dr. B. F. Long, J. S. Platt, Wm. Harris.

Wines of other Fruits—Dr. H. Clagett, D. W. Bryant, B. W. Davis, John Henwood, Jasper Turner, L. D. Votaw.

An address was then read by W. C. Flagg, Alton, on the apple.

THE APPLE.

BY W. C. FLAGG.

"In the old Lendavesta of Loroaster," said Chancellor Hoyt, in his Miscellaneous Writings, "we read that 'to be a saint,' according to the Magian religion, 'a man must be the father of orderly children, must plant useful trees, must destroy noxious animals, must convey water to the dry lands of Persia, and work out his salvation by pursuing all the labors of agriculture.'"

Among the useful trees which, as a preacher of this oriental gospel, one would most earnestly commend to the horticultural devotee, the apple stands pre-eminent; whether we consider the beauty of its vernal bloom or the excellence of its ripening fruit, the childish memories that cling around the ancestral tree, or the varied utilities subserved by the most important fruit of the north temperate zone.

"An apple tree in full blossom," says Henry Ward Beecher, "is like a message sent fresh from heaven to earth, of purity and beauty. We walk around it reverently and admiringly. We are never tired of looking at its profusion. Homely as it ordinarily is, yet how it speaks of the munificence of God better than any other tree."

"Apple trees, and all fruit trees," said Hawthorne, "have a domestic character which brings them into relationship with man. They have lost, in a great measure, the wild nature of the forest tree, and have grown humanized by receiving the care of man, and by contributing to his wants." A subtle thought, such as we might expect from the author of the Marble Faun.

Thus, agreeable to the senses, pleasant in our memories, and commending itself to our utilitarian wants by its usefulness, hardiness and cheapness, the apple remains and will remain the most valuable of the pomological gifts of a bounteous Providence, and the best beloved in the memories of childhood and home.

"The apple," says the Conversations Lexicon, "is the most wholesome, best tasted and least apt to clog of all fruits. Its economical uses in its fresh and dried state, raw and cooked, as sauced, sliced, roasted, etc., for food, are all known. Besides this it is used for cider, brandy (in Swabia and Switzerland) and vinegar. The malic acid contained in its flesh serves for medicinal purposes. The wood of the apple tree is very close, and is esteemed. The bark contains a yellow dye stuff. According to Oken's judgment the apple is the most perfect fruit, both in a botanical view, because it embraces all the flower parts, viz: of the calyx, stamina, pistils and seed, and also in respect to its importance for use. Consequently, the apple is the supremest tree. All the high-priced fruits of hot countries, the pine apple, lemon, orange, quava and mangostem are only dainties which, at best, quench the thirst, but do not nourish like the apple. They are, besides, naked

pistils, without flowers or calyx, and are, consequently, only half fruits, that can, in no way, compete with the complete apple fruit. They thrive, moreover, in only a small zone of the earth, like the imperfect animals, while the apple follows men into every clime, like their cattle."

Liebig says: "The importance of apples as food has not hitherto been sufficiently estimated or understood. Besides contributing a large proportion of sugar, mucilage and other nutritive compounds in the form of food, they contain such a fine combination of vegetable acids, extractive substances, and aromatic principles, with the nutritive matter, as to act powerfully in the capacity of refrigerants, tonics and antiseptics, and when freely used at the season of ripeness, by rural laborers and others, they prevent debility, strengthen digestion, correct the putrifactive tendencies of nitrogenous food, avert scurvy, and, probably, maintain and strengthen the power of productive labor."

The word apple is one of considerable etymological value, if we may credit Grimm and others. Wachter, according to Richardson's dictionary and the London Cyclopædia, derived it "from *a*, the intensive particle, and *bal*, anything sound." But that was in the early days of the science of language. The later authorities, such as the last edition of Webster, Grimm's Wörterbuch, his Geschichte der Deutschen Sprache, and Dieffenbach's Vergleichendes Wörterbuch give the following list of equivalents extending through a wide range of more or less kindred languages:

Celtic,	Cornish,	aval.
	Welch,	afal.
	Breton,	aval.
	Gaelic,	ubhal.
	Irish,	abhal, ubhal.
Lettic,	Lithuanian,	obolys.
	Lettish,	âbele.
S. E. Slavonic,	Old Slavonic,	jablko.
	Russian,	jabloko or jáblony.
	Illyrian,	jabuka.
W. Slavonic,	Polish,	jablko or jablon.
	Bohemian,	gablko and gablo.
Teutonic,	Old high German,	aphul, aphal, afful, apfal, ephili.
	Middle high German,	apfel; plural, epfel.
	New high German,	apfel.
	Anglo Saxon,	appel, æpl.
	English,	apple.
	Dutch,	appel.
	Frèsian,	appel.
	Old Norse,	epli.
	Danish,	æble.
	Swedish,	æple, apal, apel.
	Icelandic,	epli.

Some consider the word identical with the Greek word signifying pear tree. "Several Slavonic, German and Keltic derivations," says

Prof. Tafel, "use this word in the sense of fruit in general. Some etymologists, therefore, connect it with the German word *obst* (fruit)." Reference is probably here made particularly to Grimm, who, in his Wörterbuch, devotes considerable space to the word.

F. Unger, in the old patent office report for 1859, says: "The apple tree, of less extensive distribution (than the pear) has, nevertheless, a more universal primitive name, which consists in the not *ab*, *ap*, *al*, *av*, whence also is derived the Latin word malum, which differs little from the Greek word. The Sanscrit, Arabian and Chinese words for the apple are entirely distinct from those just mentioned."

A writer in the North British Review for November, 1864, in a somewhat caustic review of Latham's Johnson's dictionary, adds some interesting details, and differs from the last writer quoted in regard to the relationship of malum. "Under apple, too, why are we not told that in early English an apple was used of the fruit of any tree?

'Impe (graft) on an ellere,
And if thine appul be swete
Much wonder me seemeth,'"

says Pier's Plowman of an elder tree, referring to the popular belief against that tree, which was supposed to be the kind of tree on which Judas went and hanged himself. We still talk of the fruit of the potato, as apples, and we speak of "gall apples" and "oak apples" on the oak, and we call fir cones "fir apples;" so that even yet the practice has not quite gone out. Other nations, too, call the pupil "the apple of the eye," as well as we. Thus in Iceland "sjonepli," "the sight apple," for the pupil, and just as we used apple for any fruit. They used oak (eik) for any tree.

The word apple, of which Dr. Latham does not even give the Anglo Saxon equivalent, æppel—plural, æpple—is one of the most widely spread and interesting words in English. It stands with its cognates in the Celtic, Sclavonic and Lithuanian tongues, well defined against the malum and pomum of the Greeks and Romans, and it means any round, full, hanging fruit in general, though it is commonly limited to the fruit of the apple tree.

The Italian word is pomo, Spanish poma, French pomme, all from the Latin pomum. In low Latin we have bulluga, a species of apple to which is referred the Illyrian jabuka. The Gothic word, for which Grimm greatly mourns, is lost.

"The geologist tells us," says Thoreau in his essay on wild apples, "that the order of the rosaceæ, which includes the apple, also the true grasses and the labiatæ or mints, were introduced only a short time previous to the appearance of man on the globe." Lyell in his Antiquity of Man, carries us back 5000 to 7000 years into "the age of stone," and points out that at Wangein, near Stein, on Lake Constance, "carbonized apples and pears of small size, such as still grow in the Swiss forests * * also occur in the mud." "Slices of apples cut as if for drying," are mentioned in the new American Cyclopædia, as found beneath the ruins of the "lake dwellings." Here

they have lain mingled with the stone hatchets and arrow heads, the plaited cloth, the cakes of bread and bones of domestic animals that during the long lapse of historically silent centuries have remained silent witnesses of epochs as strange and unfamiliar as those of the mastodon and megatherium.

The order rosaceæ, to which the apple belongs, is one of great interest. "It includes," says Loudon, "the finest flowering shrub in the world, the rose; and the trees which produce the most useful and agreeable fruits of temperate climates, viz: the apple, the pear, the plum, the cherry, the apricot, the peach, and the nectarine. The plants are, for the most part, deciduous low trees or shrubs, all producing flowers more or less showy; and the greater number, fruits which are edible. They are chiefly natives of Europe and Asia; but several of them are also found in North America, and some in South America and the north of Africa. The fruit bearing species, and the rose, have followed man from the earliest period of civilization, and are perhaps better known to mankind in general than any other ligneous plants." He does not, of course, in his Arboretum, mention the raspberry, blackberry and strawberry, but these fruits also serve to swell the already important list of the rose family.

It is a curious fact, not mentioned I believe by botanical authors, that Western Asia, the cradle of mankind, is also the birth-place of nearly every species of rosaceous fruit. The almond is found native in the Levant; the peach, in Persia; the apricot, in Armenia and the Caucasus; the plum, in southern Russia and the Caucasus; the cherry, in Turkey; the pear, in Western Asia; the apple, in Western Asia and on the Caucasus; the quince, in Crete and on the lower Danube. It would thus seem that these were the fruits specially adapted to the use of man, and so associated with him in the region to which tradition and speculation point as the cradle of the human race.

Loudon, following DeCandolle, divides the ligneous genera of the order rosaceæ into five sections, viz:

1. Amygdaleæ, comprising the stone fruits.
2. Spiraeæ, the spiræas.
3. Potentilleæ, including the raspberry and blackberry.
4. Roseæ proper, including the rose.
5. Pomeæ, including the thorns, the medlar, pear, apple and quince.

Under the genus pyrus he puts the pear, apple, beam, service, mountain ash, and one or two others, but protests against such an arrangement, which he only makes in deference to his botanical authorities. He thinks that "no plants should be comprehended in the same genus which will not graft reciprocally on each other." This would put the apple in a genus by itself, or possibly in one made up of the apple, thorn and pear.

Gray divides the rosaceæ into four sub-orders:

1. Chrysobalaneæ.

2. Amygdaleæ, containing the stone fruits.

3. Rosaceæ, including the spiræas, strawberry, raspberry, blackberry and rose.

4. Pomeæ, containing the thorn, pear, apple, chokeberry, mountain ash, service medlar and quince.

Under the genus pyrus he comprehends the sub-genera malus, represented in America by the crabs; adenorachis, represented by the chokeberry; and the sorbus, represented by the mountain ash. This would make the apples nearest relatives to the pear chokeberry and mountain ash, with the stone fruits and small fruits as its cousins.

Having arrived at the apple proper, we find ourselves very much at sea in the classification of species, sub-species and varieties.

Loudon, in his remarks upon the order rosaceæ, speaks of "the liability of almost all the species to sport and produce varieties differing in many cases, more from one another than they differ from other species." The apple has been cultivated and propagated by seed for ages, until its departure from its primitive type or types is so great that it is difficult to assign its parentage.

Loudon attempts it as follows:

1. Pyrus malus, common or wild apple tree—Are assumed species apparently, unless we may reckon our domestic apple as a separate species.

2. Pyrus malus acerba—Sour fruited apple tree or wild crab of Europe.

3. Pyrus malus prunifolia—Siberian crab.

4. Pyrus malus baccata—Berry-like fruited crab, a native of Siberia and Dahuria.

5. Pyrus malus dioica—Dicecious sexed apple tree, of which no particulars are given.

6. Pyrus malus astracanica—Astrachan apple tree, a native of about Astrachan.

In the following the malus is dropped, as if the varieties were more specifically distinct from each other and from the above.

7. Pyrus coronaria—Common American crab.

8. Pyrus augustifolia—Narrow-leaved American crab.

9. Pyrvs spectabilis—Chinese flowering crab.

10. Pyrus quinqueflora—Said to be indigenous in Chithong.

11. Pyrus sieversii—A bush with many stems, native of Siberia.

12. Pyrus (?) schotti—No description.

13. Pyrus stipulacea—From the Himalayas.

In all thirteen species, sub-species or varieties.

The catalogue of Osborn & Sons, of London, for 1860, mentions seven of the above, and in addition has the following:

Pyrus malus foliis variegatis, evidently only a variety or sub-variety.

Pyrus malus prunifolia rosea, plainly another "sport."

Pyrus malus nigra.

Pyrus malus tatarica.

Pyrus malus hyemalis.

Concerning the last three I have no information. These swell the list to eighteen.

Downing calls pyrus rivularis a crab, and it is so classified in Eaton's North American Botany, although Loudon puts it in his section torminaria with the services. It is found in the maratime districts of Oregon.

The Handbuch der Obstkunde (1858) makes four sub-species of pyrus malus:

1. Pyrus malus sylvestris, wild crab (two varieties).
2. Pyrus malus paradisiaca, or paradise apple.
3. Pyrus malus praecox, or doucin.
4. Pyrus malus domestica, or cultivated apple.

The three first, says this authority, reproduce themselves from seed, while the fourth, or cultivated sub-species, varies greatly, but never reverts to or produces any of the other sorts; and it is added that it is the belief of many that the original of the cultivated apple came out of the orient. This last opinion is opposed to the common belief that our cultivated varieties are derived from the wild crab of Europe, but is supported by several facts. Loudon refers the red Astrachan, a tree whose peculiarity of foliage all orchardists have noticed, and the white Astrachan to pyrus malus astracanica.

I fancy that the Alexander, Duchess of Oldenburg, and the other Russian apples may have a like parentage. Knight raised the yellow ingestrie and other varieties by fecundation with the pollen of the pyrus malus pruuifolia. The botanist Ray claims that the specific characters of the English crab and our cultivated apple are more different than those of others admitted to be distinct. Upon the whole, it seems highly probable that the cultivated apple, which will not revert to the common crab when propagated by seed, which is directly traceable in many instances to Asiatic sorts, and which is first historically in southeastern Europe, is the offspring of one or more of the wild Asiatic species. If we may judge the pyrus malus prunifolia or wild Siberian crab by our cultivated fruit of the same name, it must be a fruit much more susceptible of improvement by culture than the European species, and a more probable progenitor of its putative offspring.

The ancestral tree in this case, as well as others, is difficult to determine; but it may be hoped that further knowledge of botany will sometime solve the difficulty.

Botanically described, our common apple belongs to the series of flowering plants: to the class of exogenous plants, having bark, pith and sapwood; to the sub-class of angiospermous plants, having its ovules produced in a closed ovary, and fertilized by the action of pollen through the medium of stigma; to the division polypetalous plants, the calyx and corolla being both present, the later of separate

petals; to subdivision A, of stamens numerous (20 generally); (1) calyx entirely free and separate from the pistils and stamens inserted on the calyx; to order 39, rosaceæ—leaves alternate, with stipules; pistils 1—few seeded; to sub-order 111, pomeæ, calyx—tube thick and fleshy in fruit (forming a pome), including and cohering with the 2-5 ovaries—stipules free; to the genus pyrus, calyx—tube urn-shaped, the limb 5 cleft, petals roundish or obovate, stamens numerous, styles 2-5, fruit (pome) fleshy or berry like the 2-5 carpels of a papery or cartilagenous texture, 2-seeded. Trees or shrubs with handsome flowers in corymbed cymes; to the sub-genus malus—leaves simple, cymes simple and umbel-like, fruit fleshy, globular and sunk in at the attachment of the stalk.

It is noticeable that 5, with its multiples, is the often recurring number in the botany of the apple and of many of its order. The phyllotactic arrangement of the buds upon its shoots is quin cuncial, and the consequent symmetrical arrangement of branches, that we can sometimes trace in a young crabtree, suggests some marvellous ideals of arborial perfection that, like our dreams of human perfectibility, can hardly be realized in practice. The calyx has its five sepals, the corolla its five petals. There are 4x5=20 stamens generally, and five pistils. The form of the fruit, about the 5 ovaries, is often pentagonal, as in the case of the api etoilè.

The wood of the apple tree (according to Brisson, quoted by Boussingault) has a density of .79, that of the plum being .78, cherry .75, quince .70, and pear .66. It is thus the heaviest of its tribe. In its wild state it appears to be a smaller tree than its relatives, thus:

The wild service grows 13 to 39 feet high and 17½ inches in diameter; the wild pear grows 10 to 23 feet high and 14 1-10 inches in diameter; the wild apple grows 6 to 20 feet high and 12 9-10 inches in diameter.

Shellbark hickory being valued at 100 for firewood, the apple tree is put at 70. An analysis of the wood of a sweet apple tree, by Professor Emmons (Patent Office Report 1849), gives the following result as compared with the pear.

	Sapwood.		Heartwood.		Bark of the Trunk.	
	Pear.	Apple.	Pear.	Apple.	Pear.	Apple.
Water	43.80	39.10	22.05	33.35	68.70	59.00
Dry	57.20	60.90	77.95	66.65	30.30	41.00
Ash	.20	.35	.10	.16	1.99	4.55

In the less density of pear wood and the greater amount of water in its sapwood, we have probably one of the conditions of its greater liability to blight. "Fungi always originate on plants which are young and full of sap."

In the Patent Office Report for 1850 is an analysis of the fruit of the apple, made by Dr. J. H. Salisbury, in order to determine its value for feeding animals. Six winter varieties, Tolman sweeting, Roxbury russet, Kilham russet, English russet, and Rhode Island greening, were analyzed, and the conclusion arrived at was that "in the aggregate amount of fat-producing products, the apple and the potato do not materially differ." The mean of the analysis of these six apples, as compared with those of other fruits, is as follows:

	Apple.	Pear.	Peach.	Cherry.	Gooseb'ry.
Chlorophyl and coloring matter	.....	0.01	1.10	.....	.....
Sugar, etc	8.33	11.52	16.48	18.12	6.24
Dextrine	3.14	2.07	5.12	3.23	0.78
Fibre	3.20	2.19	1.86	1.12	8.01
Albumen	1.33	0.21	0.17	0.57	0.86
Malic acid	0.32	0.08	1.80	2.01	2.41
Citric acid	.....	.....	.....	.....	0.31
Lime	.....	0.04	trace.	0.01	0.29
Water	82.66	83.82	74.87	74.85	81.10
Glutinous matter, etc	0.19	.....	.....	.....	.....
Cassim	0.16	.....	.....	.....	.....
Loss	0.62	.....	.....	.....	.....
	100.00	99.95	101.40	99.91	100.00

The cherry, the peach and the pear, all have much more sugar or fat-producing principle than the apple; but in fibre and albumen, the muscle and nerve principles, the apple exceeds.

The botanical monstrosities to which the apple as well as other plants give rise, may be of interest in considering the botany of the apple. The Cultivator of 1846 mentions apples grown apparently without blossoms on a tree, in Beekman, in the state of New York. On examination it was found that the petals of the flowers only were wanting. The fructifying process went on without obstruction, and the tree produced good crops. Gray, in his Botanical Text Book, mentions two trees in Ashburnham, Massachusetts, "in which the petals are replaced by five small foliaceous bodies like the sepals, and in place of stamens there are ten separate and accessory pistils, inserted on the throat of the calyx." These, of course, must be barren unless fertilized from other trees.

Sports of the fruit are not uncommon. Loudon, in his Magazine of Gardening, vol. 3, mentions "a very extraordinary instance of hybridity" in some apples "grown at the chateau of Brequiguy: they are

very large and somewhat oblique at their base; of a fine red on one side and yellowish or greenish on the other; the two sides are of unequal thickness, and have a different odor. The flavor is also different—that of the red side being acid, while that of the yellow side is very sweet. It may be called an apple formed by the union of half a sweet apple and half a sour apple. The seeds are scarcely ever perfectly developed, as in most hybrids, being commonly reduced to the envelopes, which, however, are very thick."

In the Cultivator for 1846, mention is made of a sweet and sour apple resembling the Rhode Island greening, but marked by external ridges, in some cases alternately sweet and sour. The editor had known the apple, or a similar one, for twenty-five years.

This is probably the variety mentioned by Downing and Elliott as sweet and sour, and which has figured a good deal in the transactions of the American institute farmers' club. One person there affirms that the proportion of sweet and sour varies in different seasons. "When the perfect compound apple grows, it is something of a triangular (pentagonal?) form, the ridges being sour and the flat sides sweet." Another says "it is sometimes one-sided. In that case the largest part is sour; but there are generally ridges from base to crown, and invariably the ridges are acid, while the hollows are sweet. Professor Nash mentioned in the same connection "an apple in Massachusetts, the fruit of which was not only sweet and sour most distinctly upon the two sides, but one side was red and the other a light color, and one-half outgrew the other." Speculatively, the different tastes have been accounted for on the theory of differences in development and maturation between the sweet and sour parts, which seems to be the opinion of Downing, or on the supposition that the growth is partially diseased like that of the ribbon grass.

There is a popular belief that such varieties have been created by putting together the halved buds or grafts of sweet and sour or other varieties, but it seems almost impossible that such a union should be a living one, or produce such a result if it were. A late correspon dent of the American institute farmers' club claims, however, that he has succeeded in making trees by that process. They have not fruited, and he thinks will produce boughs of sweet or sour apples rather than sweet and sour in the same apple.

Some varieties are peculiar in their time of blooming. The yellow Siberian crab is very early both in blooming and putting forth its leaves. The Rawles' janet, on the other hand, is from one to two weeks later than ordinary apples. John P. McCartney, of Cameron, Missouri, puts the average for nine years at eight and three-eighths days. Court Pendu Plat, Court Pendu Blanche, spice sweet, Rome beauty and northern spy are all said to be late bloomers.

Other varieties have remarkable keeping properties. In the Cultivator of 1853 the editor says of the English russett: "we have seen the apple two years old, fair, plump and juicy, kept on a shelf in a

cellar with no extra care whatever." In the same periodical for 1850 there is a notice of a seedling of James Stewart, of Hobart, Delaware county, New York, fruit of which had been kept four years, but the editor rather dryly adds: "we do not discover that they have any other quality that would recommend them."

Large apples have always been highly esteemed, and their measurements and weights more carefully noted than more valuable facts. In the Country Gentleman for 1859 one is mentioned weighing two ounces. The editor, in the volume for 1857, says: the largest we ever saw was a fall pippin, grown about thirty years ago, near Aurora, in Cayuga county, New York, weighing twenty-three ounces. Coxe mentions the gloria mundi as attaining a weight of twenty-seven ounces; a gloria mundi grown at Salt Lake City, the past year (1866), weighed twenty-eight ounces. In the Ploughboy, published at Albany, in 1820, I find mention made of an apple weighing twenty-eight and one-half ounces. Apples in California are said to have weighed, in some instances, two and one-half pounds. But this and all other apple stories are surpassed by that quoted in Ree's Encyclopædia of a Russian apple called the Kirefskoi, that often attains the weight of four pounds. One hundred apples, grown in Iowa the past season of 1866, are said to have weighed one hundred and twenty-five pounds, or twenty ounces each.

The apple tree sometimes attains a very respectable size. The largest I find mentioned is in the American Agriculturist: "Lewis Kohler writes us, that on the farm of Peter Kohler, Lehigh county, Pennsylvania, there is an apple tree, which, by actual measurement just made, is seventeen and two-thirds feet in circumference one foot above the ground; at nearly seven feet high, it is fifteen and one-fourth feet round; the tree is fifty-four feet high, and the branches extend thirty-six feet each way from the trunk." Large trees are also mentioned by Downing, as found in Rhode Island and Massachusetts; Thomas, in New York, Browne (in his Trees of America), and by others. The largest amount of fruit claimed to be borne by a single tree in a year is mentioned by Browne, who says, on the authority of Dr. Mease, that there was an apple tree at Romney, Virginia, fifty years old, forty-five feet high, with a trunk a yard and a head fifty-six feet in diameter, that in 1835 produced one hundred and eighty bushels of fruit, besides refuse, and a considerable amount carried away by visitors. The next largest story is told by Downing, of a tree in Massachusetts that bore one hundred and twenty-one and one-half bushels of apples in a single year.

If we may judge from the accounts given in books and periodicals, the apple tree attains a larger size and produces a larger amount of fruit in the United States than elsewhere, though it has not had time to attain so great an age as we find mentioned in English works.

Among the fruit exhibited at a fair in Massachusetts in 1850 "were samples said to have been taken from a tree on the farm of Peregrine

White, the first white child born in New England, and which tree was planted by him." Cole, in his fruit book, mentions having fruit from a tree in Plymouth two hundred years old; and that an apple tree brought from England and planted near Hartford, Connecticut, two hundred and nine years ago (this was in 1850), had produced fruit the previous year. In the Country Gentleman for 1860 is probably another allusion to the same tree. "At the late exhibition of the Hartford county horticultural society, a basket of apples from D. F. Robinson bore the following label: 'English pearmains from Charter Oak place.' The tree from which these apples were gathered is said to have been planted by George Willys, the original proprietor of the estate, about two hundred and twenty-four years ago. Though tottering it has yet strength—trembling at once with energy and age."

Rhind, in his History of the Vegetable Kingdom, says that "Heller mentions (apple) trees in Herefordshire that attained a thousand years, and were highly productive," but I do not find much credence given to the statement.

Climatology, in its relation to the apple, as well as to other fruits, gives rise to some interesting inquiries, and leads to some practical conclusions that may prove valuable. The apple, it is true, is a hardy tree, with great powers of adaptation, and as cultivated is found in favorable localities throughout the world, excepting the frigid zones; yet the range of its successful fruiting is much narrower, and particular varieties are often confined to a very limited area. The limitations of heat, cold, etc., are therefore of great if not of equal interest when studied in relation to the apple.

"The definite amount of heat required by plants," as discussed by Boussingault in his Rural Economy, and by James S. Lippincott, in the Report of the Commissioner of Agriculture for 1863, is the first and main topic under this head. A quotation from Boussingault may best introduce the subject:

"In examining the question which now engages us, we first inquire what time elapses between the sprouting of a plant and its maturity, and then we determine the temperature of the interval which separated these two extreme epochs in vegetable life."

In comparing these data with reference to the same species of plant grown in Europe and America, we arrive at the following curious result: that the number of days that elapse between the commencement of vegetation and the period of ripeness is by so much the greater as the mean temperature is lower. The duration of the life of the vegetable would be the same, however different the climate, were this temperature identical: it will be longer or shorter, as the mean temperature of the cycle itself is lower or higher. In other words, the duration of the vegetation appears to be in the inverse ratio of the mean temperature; so that if we multiply the number of days during which a tree is growing in different climates by the mean temperature of each, we obtain numbers that are very nearly equal. As Mr.

Lippincott states it, "a definite amount of heat is required in order to develop each plant in its progress from one stage of growth to another," and we ascertain this amount, relatively, "by multiplying the number of days required to pass through its growth by the mean temperature of the period."

We have not perhaps facts enough to determine the definite amount of heat required by any apple from the time of its first putting forth its leaves in the spring until that of the ripening of its fruit. Of the period of its blooming however, we have a pretty extended list of observations. "In twenty-six states," it is stated in the Report of the Commissioner of Agriculture for 1864, "the apple has a difference of blossoming which ranges from March 3, at Greensborough, Alabama, [Lat. 33°] in the year 1857, to June 16, at Newark, Vermont, [Lat. 44½°]."

The following table, compiled from Blodget's Climatology and other sources, will give some idea of the time of blossoming in different localities, and the mean heat of the month:

Place.	No. years.	Date.	Mean of month.
Mansfield, Massachusetts, (Medfield ob's)	40	May 21	54.49°
Roxbury, "	19	" 17	55.91°
Cambridge, "	19	" 15	55.00°
Rochester, New York	7	" 20	56.10°
Muscatine, Iowa	7	" 3	57.90°
Baltimore, Maryland	9	April 30	52.10°
Lambertville, New Jersey	13	" 26	49.50°
Rock Spring, Illinois (Jeff. bar. ob's)	10	" 20	57.10°
Chapel Hill, North Carolina	4	March 31	51.10°
Richmond, Virginia	4	" 25	59.70°

The average mean heat of the months in which blossoming occurs, is 54.17°, or not far from the result of the forty years' observations at Mansfield, Massachusetts. If the converse be true—that the apple tree, where the winter cold was not too much for its endurance, will blossom in the first month in which we find a temperature of 54° to 55°—it will not bloom at all in Labrador; will bloom in July in Newfoundland; in June in Nova Scotia and at Qubec, and as early as May at Montreal, though probably it would not ripen well at all those points.

Of the times of ripening the statistics are not nearly so satisfactory, but enough can be gleaned to illustrate the law of the definite amount of heat required by plants. For instance, the early harvest blooms at Roxbury, Massachusetts, about May 17, and ripens about July 28. The same apple, at St. Louis, blooms about April 20, and ripens about

July 1. Taking the mean temperatures of the months during these respective periods, as given in Blodget's Climatology, we have the following results:

In Massachusetts.	In Missouri.
May, 14 days x 55.91°=782.74°.	April, 10 days x 57.1°=571.00°.
June, 30 days x 65.8°=1974.00.	May, 31 days x 66.3=2049.30.
July, 28 days x 71.50=2002.00	June, 30 days x 74.1=2223.00.
72 days x 66.09=4758.74°.	71 days x 68.21°=4843.30°.

From this it appears that the same amount of heat is needed to mature the early harvest in Massachusetts and Missouri.

A corollary from this might be that a winter apple, which completed its growth at the proper season for picking in Massachusetts, might ripen sooner than was convenient in Missouri. Assuming the same dates of blossoming just given, and that the best keeping apple of Massachusetts is properly matured and in the best condition for picking on the 15th of October, I find it would have utilized 9,777° of heat; but at St. Louis the same variety of apple would have absorbed 9,697°, or only 80° less heat by the 1st of September; and if it remained on the tree until the 15th of October, it would have been exposed to 12,558°, or nearly 3,000° more heat than its eastern relative. That amount of heat, however, appears to be the cause of its growing mellow and decaying in the orchard in this latitude [39°] by the time the Rawle's janet is ready for picking. For the latter apple our season seems not any too long, and it is probable that in Massachusetts it would not mature sufficiently on the trees to properly ripen in the house. On the other hand, could the Roxbury russet be gathered here about the 1st of September, and be placed in a suitable temperature, it might sustain its eastern reputation as a keeper. The rule may even be made general that no late keeping apple of north or south will prove satisfactory as such when grown out of its latitude. The late keepers of the north make desirable fall and winter apples for the south, to some extent. The early apples of the south are often found to succeed north, and those of the north in the south; but late keeping apples are not interchangeable from the nature of the case.

Another deduction is that with different varieties of winter apples we must pursue quite different methods, the rule generally being that an apple which drops early must be picked early. An apple that drops without disease is getting its full of warmth and sunshine, and should retire from the orchard to cooler haunts. The Newtown pippin and Pryor's red mature earlier than the Rawle's janet, and should be picked accordingly.

The same variety of apple grown in different climates differs considerably in other respects than keeping qualities. One curious dif-

ference is that of color. The apple grown on the shores of Lake Erie is higher colored than that grown at Cincinnati; those in Michigan than those grown in Southern Illinois. The cause of this seems not well ascertained. De Flotow, and before his time, Duhamel (Country Gentleman, 1857), has noticed that water placed upon fruit next the sun, while on the tree, hightens the color. M. de Flotow has remarked, but without being able to account for the fact, that in apples and pears which were striped on both sides, the rays or stripes were longitudinal, that is, from the eye to the stalk, but never transversely. * * The results of the experiments have led to the conclusion that the action of the sun's rays upon the skin of the fruits, wetted or moistened by dew, is the cause to which the production of those red bands is to be assigned. "If," says he, "fruits wetted by dew are observed while the rays of the rising sun strike upon them, it will be seen that the moisture collected in drops on the edge of the cavity in which the stalk is inserted and on the sides from lines of moisture of greater or less length, according to the size of the drops, and according as the sun evaporates them with more or less rapidity. It will be understood there must be great difference in the streaking according as the dews are more or less frequent, according as they are light or heavy, and according to the sun's rays and the fineness of the skin. It is likewise probable that the difference between the day and night temperature has some effect in this respect; and streaked fruits are generally autumn or winter varieties." In this extract may perhaps be found a reason for higher color in higher latitudes. Russet, it is noticed in some instances at least, increases as a variety is carried southward. This is the case with the Roxbury russet, Pryor's red and others. Early summer apples are generally not red and never russet. The succession of color seems to be green, white, yellow, red, russet, varying with the temperature of the place, and with the season.

The geographical distribution of the apple partly by climatological conditions, and partly by the state of civilization in various countries. The wild apple in its different species extends over a wide field. "The pyrus malus, or some of its varieties," says the New American Cyclopædia, grows spontaneously in almost every part of the northern hemisphere, except in the torrid and frigid zones and some of the islands in the ocean. It is found throughout Western Asia, China, Japan, North America, and in the north of Europe as far as West Finland, in latitude 62°, in Sweden in latitude 58° or 59°, and Central Russia to 55° to 60°. The crab of Europe, however, is wanting in Siberia, where its place is abundantly supplied by the p. m. prunifolia, and the p. m. baccata."

The following is an approximate assignment of the different wild species:

In Asia we find p. m. spectabalis; in China p. m. stipulacea; on Himalayas, p. m. prunifolia, p. m. sierversii and baccata; in Siberia p. m. astracanica, in southeastern Europe and Western Asia, as far south

as Persia. The subspecies p. m. praecox (doucin), on the authority of J. Scott, in the Cottage Gardener, quoted in our Gardener's Monthly for July, 1866, is found in great quantities in Asia Minor, on the mountains up nearly to the snow line. In Loudon's Magazine of Horticulture mention is made of the apple and pear in great quantities in the valley of Cashmere, but whether a spontaneous growth or of what species is not stated. Yet the Patent Office Report for 1859 says that "at the present day neither the apple nor the pear occurs wild in the east."

In Europe we have p. m. acerba or sylvestris, of which there are said to be two varieties, and it is probable that the Asiatic species extend into its territory to some extent.

In America we have p. coronaria, augustifolia and rivularis. Pyrus coronaria, our common crab, according to the North American Sylva, is found throughout the United States east of the Rocky mountains, except in some parts of New England. Its northern limit in the Appallachian district is given in the Patent Office Report of 1860 as 43°. Thoreau mentions finding it in Minnesota, and C. R. Hoag, of Mantonville, in that state, informs me that it is found there so far north as the British possessions, or 49° of north latitude. Though very fragrant in blossom and fruit, the latter is harsh and generally uneatable, though varying a good deal in its ancestry. The soldiers in our frontier forts, and our pioneer settlers, have sometimes in their craving for fruit eaten even the crab apple, and found some varieties of it even palatable. I have seen it increased to a size exceeding that of the lady apple, simply by cultivation. It is thought by some to hybridize with our domestic apple. James G. Soulard, Esq., of St. Louis, is confident that the variety known as the Soulard crab is a true hybrid of this kind. I have seen a conical red striped apple gathered in the midst of a crab apple thicket in the American bottom, near Alton, which was thought to be a hybrid. Benjamin Sweet, of Melrose, Clark county, Illinois, states that "there is a wild crab standing on Union prairie, one mile north of York, on the Wabash, which is evidently a cross between the tame and wild crab, partaking of both, which is the best for preserving of any apple kind."

This crab has been used to some extent as a stock for grafting where curiosity, the lack of better stocks, or its known hardiness has suggested the experiment. A tree grafted with the Newtown pippin, about three feet from the ground, on the farm of L. W. Lyon, near Bethalto, Illinois, was broken off by the graft outgrowing the stock. The Prairie Farmer, during last year, has made mention of at least three instances of successful top grafting at Geneva, Wilmington and Wheaton, in northern Illinois. In one case the trees have endured twenty years, and are still productive.

Pyrus augustifolia is so much like the coronaria that many doubt whether it be anything but a variety of it. It is found within narrow limits in Pennsylvania, New Jersey, and, perhaps, southward.

Pyrus rivularis, according to Nuttall, is common throughout all the lower or maritime portion of the Oregon territory, and it uniformly affects the shade of rich alluvial forest near the lesser streams and ponds. The tree is about the size of the Siberian crab, to which it has a close affinity, and grows from fifteen to twenty-five feet in hight, producing a hard wood, capable of receiving a high polish, and is employed by the natives for making wedges. The fruit grows in clusters, and is small and purple, scarcely the size of a cherry, of an agreeable flavor, like that of some of our haws. It has nothing of the acerbity and acidity of the common crab, but is sweetish and subacid when ripe. The natives near the sea employ it, as they do many more berries of the country, for food, being too indolent to cultivate the earth for any purpose whatever.

"It extends, in all probability, from Upper California to the Russian possessions in the north, as far as latitude 57°. Menzies appears to have been its first discoverer."

Loudon classes this species with the section forminaria among the services, but the authorities appear to be against him.

Jarves, in his history of the Sandwich Islands, mentions among its fruits "ohia (a juicy red apple, but of poor flavor), indigenous and plentiful." I find no mention of it elsewhere, but am informed by persons who have seen it that there is such a fruit, though there may be some doubt as to its belonging to the genus pyrus.

I do not know that any wild species of the apple is found in Africa, South America, Australia or other islands of the southern hemisphere. "This order," says Carpenter, in his Vegetable Physiology of the Rosaceæ, "principally abounds in the cold and temperate regions of the northern hemisphere. In fact, scarcely any species of the rose, apple and almond tribes are found elsewhere. There is a small group, however, distinguished from the rest of the order by the constant absence of petals, which abounds at the Cape of Good Hope, where it represents the rosaceæ of Europe."

The range of the cultivated apple is, of course, extended much beyond the natural limits of the wild species. Whether those regions in which the wild sorts abound have proved specially congenial to the cultivated, I am unable to say with any certainty, but I think the facts tend to show that such is the case.

Beginning again with Asia, we have from Japan the testimony of Thomas Hogg, in the Horticulturist for 1864: "I had almost forgotten to include apples in the list of fruits brought to market for sale. Not many are brought in, and their season is soon over. They are a very small, early variety, and when eaten just at the right time are very passable." S. Wells Williams, in the Patent Office Report for 1860, says that the apple, pear, quince, plum, apricot and peach of China "are generally inferior in flavor to those here, with the exception, perhaps, of the two last, which furnish some delicious sorts." Ireland, in his Wall Street to Cashmere, in speaking of the fruit of Cabul, says:

"The apples were fine, but not so high flavored as ours." Loudon says: "The apple is stated by Royle to be cultivated in the southern parts of India, and also in the Himalayas, and in China and Japan; but it is not indigenous to the warmer parts of those countries." Apples are enumerated among the horticultural products of Persia, and we have one Persian variety at least—orack elma, mentioned by Hogg in his British Pomology. The new American Cyclopædia states that "at the present day in Canaan and surrounding countries it (the apple) is worthless as a fruit. Apples are imported into Egypt and Palestine from Damascus." The word translated apple in our version of the Bible, it may be added, is now generally believed by critics to refer to a different fruit from the pyrus malus. "It is remarkable," according to Dr. F. Unger, "that in the entire east only summer apples are cultivated; never late kinds which can be kept over winter."

From the continent of Africa our information is meagre. F. H. Hyatt, writing from Tangier, opposite Gibralter, says, in the fifth volume of the Horticulturist: "Of apples, * * there are plenty of full grown trees, but the fruit is not fit to eat. But whether it is the fault of the climate or the people, in not introducing the choice varieties, I am unable to state." In the adjacent islands, "the golden pippin," says Charles McIntosh, in his Orchard and Fruit Garden (1839), "is cultivated to a very considerable extent on the mountains of Madeira, even at an altitude of 3000 feet above the level of the sea, where it produces abundant crops." "Notwithstanding," adds another writer, "the trunks and branches are covered with moss." The 3000 feet elevation is probably the cause rather than an obstacle to success in the warm climate.

From Europe we have more sources of information as well as a more extended and intelligent experience. In the Orkney and Shetland Islands even, in 60° of north latitude, Rhind informs us that very fair fruit is grown. On the Scandinavian peninsula the apple tree, according to Loudon's Magazine of Gardening, vol. 2, grows as far north as 62° to 63°. This is within a few degrees of the arctic circle, about the latitude of the Great Slave Lake. Kohl, in his Russia and the Russians, in 1842, gives in his account of St. Petersburg some idea of Sclavonic fruit growing. "In regard to climate, our fruits are in much the same predicament at Petersburg as the southern fruits, such as pomegranates, oranges, lemons, etc., of Milan and Florence are in the climate of the north of Italy. Only apple trees and some sorts of pear trees can be left exposed to the open air during winter, and though the fruit they bear is wretched enough, yet it is prized on account of its rarity and the great pains requisite for rearing it. * *

"Apples are supplied principally from the Crimea and from Stettin. At the latter place large cargoes of apples are every autumn shipped from all parts of Germany for Petersburg, and one may expect an apple to be worth eating when it is recommended as a Stettiner. The Krimski jabloki (Crimean apples) are an exceedingly agreeable

fruit. They are firm, juicy, ruddy skinned fruit, of the size and form of a goose egg, and they possess the peculiarity of retaining their freshness for a great length of time. They are brought from the Crimea, where the Tartars grow them in their extensive orchards, and are conveyed to all parts of Russia by the great fruit caravans. In Moscow and St. Petersburg these apples are a favorite fruit. The glass apple is a species peculiar to Russia, where it grows in tolerable perfection. This apple is of a perfectly round form, and the skin, which is as transparent as green glass, shows the flesh through it. It is delicious to eat these ripe glass apples in the magical twilight of a Russian summer night (the poetry of apple eating!); and it is matter of surprise that they have not been celebrated in some garden legend of the north, as the fruit of the garden of the Hesperides are renowned in mythological fictions."

In Ree's Encyclopædia, article Apple, we find some further facts of the orchards of southern Russia. "In Tooke's View of the Russian Empire, we are told that all the villages on the Volga and Otka have their orchards or apple gardens; and numbers of boors live here without husbandry, merely by horticulture, in good circumstances. In prosperous years it is not uncommon for a countryman to take from three to four hundred rubles of a chapman, who agrees for the fruit on the trees and gathers them himself; and many villages get sometimes above ten thousand rubles. The kinds of apples growing here are originally from Astrachan and Persia. The most remarkable is the Kirefskoi apple, which often grows so large as to weigh four pounds (!), having an agreeable acidulous flavor and keeping a long time. About Moscow and many of the adjacent governments are produced many excellent sorts of apples, particularly a transparent kind, brought originally from China, full of juice and extremely well tasted, called nalivui (full melting)—as in fact it is so full of juice as to be ready to burst. Their flavor is a pleasant acid; and, on holding them up to the light, the core is distinctly seen and the pips may be counted."

Of English apples and orchards, perhaps Olmsted's description in his Walks and Talks, is one of the most interesting. "There are but few orchards in England, except in certain districts; and in these they abound and are often very extensive. The inquiry naturally arises, What has given these districts their distinction in this respect? Have they any natural advantages, which make orcharding more profitable in them than in other parts of the country? In reply, I learn that the orchard districts are all distinguished for a comparatively mild climate. They are nearly all in the south or southwestern counties, while in the northern and eastern counties I do not know of any. * *

"Another important circumstance to be noticed, as distinguishing the apple districts, is in the nature of their soils; these are found, however varying otherwise, invariably to have a large proportion of lime, and, generally, of potash, in their chemical composition. * * * * * * * *

"To obtain choice desert fruit, the apple is everywhere, in England, trained on walls; and, in the colder parts, it is usual to screen a standard orchard on the north by a plantation of firs. There is no part of the United States where the natural summer is not long enough for most varieties of the apple to perfect their fruit. In Maine and the north of New Hampshire and Vermont, the assortment of varieties is rather more limited than elsewhere, I believe; but I have eaten a better apple from an orchard at Burlington, Vermont, than ever was grown even in the south of England."

The counties most suitable for the apple are Worcester, Somerset, Devon, Hereford, Kent, and, perhaps, one or two others. The apple was grown very early in Norfolk, Yorkshire and Gloucestershire. Hogg, in his British Pomology, gives a list of varieties for northern Scotland, whence we may infer, at least, an occasional planting, even in that cold climate. Among the varieties recommended, we may recognize Hawthornden and Keswick Codlin—two varieties that our prairie pomologists speak well of.

A writer in the Every Day Book for 1824, gives some reminiscences of his boyhood in the London markets, from which we glean a few facts of sixty years since: "Apples came in with 'green codlins;' then followed 'golden rennets,' 'golden pippins' and 'ripe nonpareils.' These were the common street fruits; such 'golden pippins' as were then sold three and four for a half penny, are now worth pence a piece, and the true 'golden rennets' can only be had of great fruiterers. The decrease in the growth of this delightful apple is one of the 'signs of the times.'

"The finest apples in Covent Garden came from Kent. Growers in the county, by leaving only a few branches upon the tree, produce the most delicious kinds, of a surprisingly large size. For these they demand and obtain very high prices; but, instead of London, in general, being supplied, as it was formerly, with the best apples, little else is seen except swine feed, or French or American apples."

"The apples in England," says Coleman, in his European Agriculture, "are in general inferior, except for cooking purposes. The superiority of our Newtown pippin is everywhere admitted and proclaimed."

Donald G. Mitchell, in the Cultivator for 1845, gives some account of the apples of the Isle of Jersey: "The orchards are scattered thickly over the island; scarcely a house being without its perquisite of cider trees. The trees are small and covered with a green moss, the consequence of the humidity of the climate. I observed the same of the orchards of Devonshire. A great deal of cider is drunk, and many thousand hogsheads shipped annually to England. Their best apples for eating are much inferior to ours, though superior to any I saw in England. They are fair and beautiful to the eye, but lack flavor and life; the best I have seen is a pearmain, of flavor very like our seek-no-further, but inferior to it. They sell at a penny and a half each."

In Switzerland, the same author informs us, "apples of very fair appearance and taste are plentiful in the lower districts." The Canton Berne is most notable for its apple products.

Normandy and Brittany, in France, are the most notable apple regions. Normandy is famous as a cider district, but I find no high estimate placed upon its fruit for table uses. Of apples in the Paris markets, a writer in Hovey's Magazine of Horticulture for 1866 says: "At the fruit shops and in the markets you see some superior specimens of some varieties; but most of the apples that I have seen seemed to me to be small and indifferent. The best apple that I have eaten here is the Calville blanc. This is here very fine, juicy, tender and of very pleasant flavor; but my experience is of a very limited character. The price of the best apples is very high—for a fine Calville, half a franc each."

In Italy, the same author, writing from Rome, says: "Apples are not very good; they are of tolerable flavor, but are not tender; they are very solid, and seem as if they would keep for months yet." This was in the beginning of March. Theodore Parker is not much better pleased with Roman apples, when he speaks of them, in one of his letters, as "poor, very poor, close-grained, tough and indigestible." At Naples, the writer first quoted says: "Apples—winter apples at least—are very poor. I have seen several varieties, and they all had the same fault—were hard, and never became mellow; and this, I learn, is generally the case. Some that I have tasted are of good flavor, and they keep well, being hard and perfectly sound now on the first of May." A writer in the Patent Office Report for 1859, speaking of Catania, in the Island of Sicily, gives a more favorable report of that region: "The best fruit we found here were some delicious pears, sold at a cent each, and the Simoncelli apple, which grows upon the slopes of Mount Ætna, and has a delicate flavor."

Baird, in his Modern Greece, says that at Athens "apples are a rarity, and those for sale are small and inferior." In the Ionian Isles, judging from Hogg, there must be some cultivation of apples.

From all these various extracts it would seem that European apples, as a general rule, fail to mature well, probably from an insufficiency of summer heat.

In America the highest point at which I have observed the apple in cultivation is Quebec, about latitude 47°; and I am told that at that point the fruit is inferior, and the cultivation of it unprofitable. At Montreal there are said to be productive orchards of fine fruit. A writer in the Ploughboy, of 1820, alluding to a statement of Mr. Coxe, in his View, then only a few years published, says: "I think Mr. Coxe is mistaken in confining the production of the best apples within the limits of the Mohawk river, in New York, and the James river, in Virginia. I can truly assert that I never eat fruit equal, either in richness or flavor, to fameuse pomme grise oi bouruchers, cultivated in the Island of Montreal." There appears to have been some confu-

sion of nomenclature here. In the Cultivator for 1844 we find an editorial notice of some apples received from Nova Scotia, in which the writer says, "the people of Nova Scotia have no need to send abroad for that description of fruit; but on the contrary, the soil and climate of that country will admit of their producing fine qualities for their own consumption and exportation." The varieties found most successful in that province were Gravenstein, Ribston pippin and pomme de gras.

On the Pacific coast of the continent, the apple will of course flourish considerably north of 43°. The pyrus rivularis is found as high as 57°. A correspondent of the Alton Telegraph, writing from Corvallos, Benton county, Oregon (latitude 44°), in November, 1865, says "the country is now full of fine apples going to waste. * * Perhaps no country can beat this for fine apples. The trees, or rather shrubs, bear early, constant and abundant; so much so that they cannot be made a tree of; they are nothing but shrubs or dwarfs."

In the interior, according to C. R. Hoag, of Minnesota, "certain kinds of apples succeed as far north as St. Paul (45°), or a little further. I think the apple has not been tried to much extent further than there. The sorts that succeed best with us are Duchess of Oldenburg, fameuse, Tollman's sweeting, red Astrachan, sops of wine, white winter pearmain, yellow bellflower, pomme grise, English golden russet, red romanite, Bailey's sweet, winesap and Perry's russet." In the Country Gentleman for 1858 the following varieties are pronounced hardy in nursery, at La Suer, Minnesota: red Astrachan, fameuse, maiden's blush, Harrison, Belmont, Swaar and English russet. These lists would perhaps be qualified now.

Of the northern and eastern portions of the United States I need not speak at length. Its many favored localities, famous for originating and producing fine apples, are well known to the readers of Coxe, Kenrick, Cole, Downing and Thomas. New York, the birth-place of the Newtown pippin, the northern spy and Esopus Spitzenberg, was noticed as early as Coxe's time, as pre-eminent. Massachusetts, with the Baldwin, Benoin, Hubbardston, nonesuch and Roxbury russet, gives a good reputation to granitic and icy New England. New Jersey, in the yellow bellflower, maiden's blush, rambo and winesap, has an enduring pomological fame. Western New York and Michigan are large contributors to the fruit commerce of the north; and the banks of the Ohio and the Mississippi have long supplied or endeavored to supply the wants of Minnesota. Louisiana, Virginia, North Carolina and Georgia have produced varieties that have obtained great and will have greater approval. Northern Georgia, the western Carolinas and eastern Tennessee comprise a region very favorable to the production of fine fruit. In the Prairie Farmer for 1860 I find the following statement: "Professor Buckley says, that no finer apples are grown in the United States than are grown in the mountain regions of North Carolina, mostly from seedlings planted by the Indians." Charles

Downing writes in January, 1866: "The richest and highest flavored apples I ever ate came from Georgia and the table lands of the Cumberland mountains of Tennessee." Going further south, we come upon more uncertain territory. Kenrick, in his New American Orchardist, says "the apple is said to flourish in every part of the United States, except the low lands of the maritime districts of Carolina, Georgia and Florida, and the low prairies or savannas bounding on the Gulf of Mexico." Yet James McGoffin, in the second volume of the Gardner's Monthly, writes, "the mammoth pippin is found succeeding admirably thirty miles south of Mobile, on the margin almost of the gulf." In the Cultivator for 1848 we find that "the Alabama Planter states that during the past summer the Mobile market was well supplied with apples, the growth of the immediate vicinity. Among them were large greening pippins (Newtown), and russets of the northern states. The first grew remarkably large. Trees brought from the north attain a large size in five or six years; and the standard winter apples of Massachusetts ripen by the end of the summer months." In Florida, according to the Report of the Department of Agriculture for 1862, "the apple does not succeed, but the quince bears in the northern part." In Texas, according to a writer in the Cultivator and Country Gentleman for 1866, "apples do very well in most of the northern counties, but south of latitude 31° they are cultivated to a very limited extent. They are often retailed in Austin during the winter season at from five to ten cents each." In the same volume, we learn that in northeastern Texas "apples, pears and peaches thrive and bear good crops, but they do better on all sandy, clayey soils." Governor Arny, writing in the Prairie Farmer for 1865, says of New Mexico: "This district grows many varieties of fruit—apples, pears, peaches, pomegranates, Prussian walnuts and apricots produce well." At Salt Lake City, in the Utah territory, Bowles, in his Across the Continent, mentions seeing "the most promising orchards of apricots, peaches, plums and apples that these eyes ever beheld anywhere." A correspondent in the Monthly Report of the Commission of Agriculture, for November, 1865, writing from a point three hundred miles south of Salt Lake City, says that at that point "apples seem not so well adapted to the climate."

California, and its neighbor Oregon, are celebrated for the size, abundance, and in some cases the quality, of their fruits. A writer in the New York Tribune, dating at San Francisco, December 18, 1865, says "the apple tree bears in the second or third year from the bud, and apples have been exhibited weighing two and a half pounds. Distinctly a northern fruit, however, requiring a cold climate, it has not the pungent flavor which New England and Oregon impart." In the Rural World for 1866 is an account of some California apples exhibited before the Meramec horticultural society: "the fruit committee reported samples of apples from the orchard of Rev. John E. Brawley, Santa Clara county, California, formerly of Franklin county, Missouri, viz: genitan (Rawles janet), Gilpin, Newtown pippin, and variety

unknown; the fruit was the clearest and most wax-like of any ever seen here, a pure yellow, almost entirely destitute of red, worthy of preservation as artistic specimens, but almost entirely beyond identification. * * Dr. McPherson stated that [no] fruit and hardly any vegetables could be raised in Nevada. These articles are obtained from California; there fruit is abundant, of large size, fine color, but lacking flavor."

P. S. Burnes, Esq., of Oakland, California, writing in 1866, says: "Apple trees continue to be rather in a growing state all winter; some varieties never being denuded of their leaves, and young shoots starting out in December and January. Some kinds, pruned in the latter month, bleed like a grapevine cut in May.

"The following apples are represented as being first rate: Red Astrachan, Townsend, white winter pearmain, yellow Newtown pippin. Very good: Red June, early harvest, Gravenstein, yellow bellflower, Peck's pleasant, Rhode Island greening, Smith's cider, fall pippin.

"The rambo is good, but small; twenty-ounce nice, large, and does well; golden russet, good, great bearer, but small; Porter, first rate for cooking; maiden's blush, not very good; Roxbury russet, falls off; Swaar, rather too sweet; green Newtown pippin, tree don't do well; Newtown Spitzenberg, falls off too soon, otherwise does well; Esopus Spitzenberg—tall trees don't grow well; winesap, too small; Baldwin, don't do well."

As California is a dry rather than a hot country during the summer and autumn, we are led to conjecture that aridity is the cause of lack of red color in the apple mentioned.

In South America the apple is grown in Venezuela. Humboldt, in his Travels, says: "When a traveler for the first time visits Caracas he is agreeably surprised to find the culinary plants of our climates, as well as the strawberry, the vine, and almost all the fruits of the temperate zone, growing beside the coffee and banana tree. The apples and peaches esteemed the best, came from Maracas, or from the western extremity of the valley. * * I observed in this province, as in Mexico and in all the elevated lands of the torrid zone, that where the apple tree is most abundant the culture of the pear tree is attended with great difficulty. I have been assured that near Caracas the excellent apples sold in the markets came from trees not grafted."

Tschudi, in his Travels in Peru, says: "The fruits of the temperate climates of Europe thrive but indifferently in the warm regions of the coast of Peru. Apples and pears are, for the most part, uneatable." Again he says: "The fruits which have been transplanted from Europe are, for the most part, indifferent, as not the least care is bestowed on their cultivation. The effect of this neglect is particularly obvious in apples, pears and damson plums."

In La Plata, according to the Volume of the World, apples and other fruits flourish in luxuriance in the central and southern

provinces. A writer on sheep farming in the pampas, in the report of the commission of agriculture for 1864, says: "With few exceptions all the fruits of all the climes of the globe might be cultivated with success. The apple is one of the exceptions. It grows healthfully, and attains to a large size, but is coarse, juiceless and destitude of flavor."

We have a better account from the Pacific coast. Lieutenant Gillis, in his United States Naval Astronomical Expedition, gives some interesting facts concerning the culture of this fruit in Chili. Speaking of the province of Santiago, latitude 33° south, he says: "Olives, oranges, lemons, figs, grapes and all the fruits of temperate zones grow well; though from the extreme dryness of the air in summer the skin of apples and peaches often cracks, and their fruit has little juiciness." At Concepcion, about latitude 37°, he adds, "there are literally forests of apple trees growing without culture, from whose fruit large quantities of chicha are made." Chicha is the boiled juice of the grape, apple, etc. In Valdivia, latitude 40°, he says: "The great crop for chicha is apples, of which an amazing quantity are grown, and there is probably no part of the world where the trees thrive better, or with less trouble. Nor is the manufacture of chicha the only use to which this fruit is applied. By one process they extract a white and finely flavored spirit (is it not apple brandy?) from the refuse pulp, and their children and pigs seem almost to live in the orchards when the fruit is ripening." In Chiloe, the southernmost province, being now in latitude 41°, and in a moist climate, he adds: "Here, as in Valdivia, the apple trees are very numerous; and the Chilotes have a marvellous short way of making an orchard. At the lower part of almost every branch small, conical, brown and wrinkled points project. These are always ready to change into roots, as may sometimes be seen when any mud has been accidentally splashed against the tree. A branch as thick as a man's thigh is chosen in the early spring, and is cut off just beneath these points. All the smaller branches are lopped off, and it is then placed about two feet deep in the ground. During the ensuing summer the stump throws out long shoots, and, sometimes, even bears fruit. Dr. Darwin was shown one which had produced as many as twenty-five apples, though this was thought very unusual; and another was pointed out to him which, in the third season, was changed into a well wooded tree, loaded with fruit." A very paradise for nurserymen.

The apple is cultivated in New Zealand, and also in Australia, but with what definite results I am unable to learn.

Having traversed the globe from continent to continent, we find everywhere, from the Asiatic table lands, that cradled the human race, to the uttermost parts of the earth that civilized man has reached,

> "The old apple tree,
> With its o'erhanging golden canopy
> Of leaves illuminate with autumnal hues
> And shining with the argent light of dews."

In the long experience which it has had, the apple has developed, of course, many varieties. It is moreover a characteristic of the order rosaceæ, according to Loudon, to sport and "produce varieties differing in many cases more from one another than they differ from other species." The history of the apple shows a list of varieties, small at first and increasing rapidly during the present century. Theophrastus, we are told, knew two kinds; Cato 7; Pliny 23 (or 36, the authorities varying); Parkinson (1629) enumerates 57; Real (1665) 20; Meager (1670) 83; Worcidge (1676) 92. I find no satisfactory information of progress made in this respect during the 18th century. Forsyth (1810) describes 196 sorts; Coxe (1817) 133; Christ (1817) 213, and gives the names of many more; Lindley (1831) 214; Kenrick (1844) 125; Hogg (1851) 942; Downing (1857) 626; Elliott (1860) 683. Hogg tells us that Robert Thompson, in the Horticultural Society Catalogue, has enumerated over 1400 varieties; Charles Downing is said to have 1500 or more on his grounds, and I have heard it intimated that an orchard in Illinois has even more than this.

But when we undertake to select from this formidable list the varieties that are at once first in quality, productiveness, hardiness, etc., it shrinks into much more manageable limits, and the number is still further reduced when we come to find what varieties succeed in a given locality, as we shall hereafter see.

As to age of varieties the api, our lady apple, is the one of the greatest probable antiquity. It has been asserted, says Hogg, that it was brought from Peloponessus to Rome by Appius Claudius. The winter pearmain, our Herefordshire pearmain, is regard by Hogg as the oldest English apple on record, going back as far as the year 1200; the Costard is mentioned 1292. The catshead, Loudon pippin and winter quouinig are also very old English varieties.

Some varieties have been perpetuated merely from curiosity, such as the surprise apple, for its red-tinged flesh; the sweet and sour, for its diverse taste; the gloria mundi, for its enormus size; the Colville rouge de micoud, for its reputed three crops in a season, etc.

Popular French varieties I find to be api, Astrachan, Colville blanc d'Hiver, Colville d'Eté, Chataignier (keeps two years), Fenouillet, Rambourg d'Eté, Reinette, Reinette hative. Among these we recognize two or three acquaintances.

In a list of seventy varieties, recommended in 1855 by the votes of thirty-six German pomologists, I find Grafensteiner standing first with 27 votes, followed by rother herbstcalville and Englischer wintergoldparmäne, with 26; grosse Casseler, gold Reinette, 22; Danziger kautapfel, 17; weisser wintercalville, 13; Astrachanischer sommerapfel and Kaiser Alexander, 12; rother winter taubenapfel, 11; weisser sommerwürzapfel, 10; Charlamowski, 9. This last is Duchess of Oldenburg. Here are four varieties common in the United States. The following list was recommended for general cultivation in Germany in 1853:

Pariser rambourreinette,
Grosser Rheinisher bohnapfel,
Linken apfel,
Calvillartiger winter rosenapfel,
Englischer wintergold parmäne,
Grafensteiner,
Carmeliter reinette,
Rother taubenapfel,
Winterborsdorfer,
Grosser Casseler reinette.

Here is the Grafenstein again.

The above lists are from the Obstbau of H. Yäger, published in 1856. In the Handbuch der Obstkunde, published in 1858, at Stuttgart, is a list of eighty varieties that I presume may be regarded as the choicer sorts of that famous apple region. Among these are our friends Grafenstein, yellow bellefleur, red Astrachan, Duchess of Oldenburg, Alexander and beauty of Kent.

The bellefleur and Franklin's golden pippin (an apple we know very little about) seem to be the only importations from America, unless we may add the wine apple.

The English, owing probably to the greater facility of communication, have adopted more of our varieties. Hogg gives lists of apples for different lâtitudes in Britain, and for various uses, among which are early harvest, Boston (Roxbury) russet, Rhode Island greening, Franklin's golden pippin and gloria mundi. Among varieties not American the English seem to approve as well as ourselves of Keswick codlin, Duchess of Oldenburg, Grafenstein, Alexander and hawthornden.

The catalogue of apples of the American pomological society, compiled in 1864, gives, after deducting synonyms and names not proposed by any district, 174 varieties that are recommended by 28 out of 35 districts comprised in 24 states and the two Canadas, and embracing the territory east of the Rocky mountains, and about 7 degrees of latitude (from the Canadas to the southern line of Tennessee). Of these 174 varieties 22 are foreign and 152 native, or about one-eighth are foreign and seven-eighths are native. Of these Virginia originates, as nearly as I can ascertain, 17: Bohannon, Bowling's sweet, Brook's pippin, Carter, Gilpin, Hewe's crab, Holladay's seedling, limber twig, Milam, Myer's nonpareil, Pryor's red, Rawle's janet, red cathead, Roby's seedling, Robertson's white, Waigh's crab, Wellford's yellow. Massachusetts has 16: Baldwin, Benoin, Danver's winter sweet, fall orange, garden royal, hightop sweeting, golden russet, Hubbardston nonesuch, Lyscom, Manomet, minister, mother, Munson sweet, Porter, Roxbury russet and William's favorite. New York has supplied 13: Bailey sweet, early Joe, Jonathan, ladies' sweeting, late strawberry, Melon, Newtown pippin, northern spy, Sine-qua-non, Spitzenberg (esopus), Swaar, Vandevere (of New York), Wagener. Pennsylvania, 11: Belmont, Cornell fancy ewalt, fallowater, Jeffries, Pennsylvania

red streak, ridge pippin, Smith's cider, smokehouse, summer sweet, paradise, Townsend. Connecticut has introduced 13 varieties: Cogswell, exel, fall genitan, golden sweeting, Hartford sweeting, Hurlbut, Lyman's pumpkin sweet, progress, Ramsdell's sweet, Sheppard's sweet, summer queen, twenty-ounce apple, Westfield seek-no-further. New Jersey, 9: Bellefleur (yellow), maiden's blush, Michael Henry pippin, Monmouth pippin, Ortley, rambo, Roman stem, winesap, willow twig.

In the number of approved varieties Virginia leads, Massachusetts coming second, Connecticut and New York third, Pennsylvania fourth, and New Jersey fifth. But if we take the votes the different apples have received, we find that the varieties originating in New York stand first; those of Massachusetts second; and those of New Jersey third; Virginia, Pennsylvania and Connecticut falling far in the rear.

In the twenty-eight districts the early harvest receives twenty-seven votes, and is, therefore, the most popular apple of America. Virginia is not put down as voting for it. Red Astrachan comes next, with twenty-three, and rambo with twenty-two. The following table shows that forty-one varieties have received ten or more votes. I place them under the three seasons, in the order of their preference:

Early.	Medium.	Late.
Early harvest.....27	Rambo.....22	Jonathan.....18
Red Astrachan.....23	Bellefleur.....21	Bullock's pippin.....17
Large yellow bough.....20	Fall pippin.....21	Hub. nonesuch.....16
Summer rose.....19	Maiden's blush.....21	R. I. Greening.....16
American summer pear.....18	Fameuse.....17	Roxbury russet.....16
Porter.....15	Gravenstein.....16	Winesap.....16
Benoni.....14	Dyer.....13	Baldwin.....15
Early strawberry.....14	Fall wine.....10	Smith's cider.....15
Golden sweeting.....14	Lowell.....10	Tolman's sweeting.....15
Early Joe.....13		Northern spy.....14
Jersey sweeting.....13		Newtown pippin.....12
Early red June.....12		Peck's pleasant.....12
Keswick codlin.....11		Rawle's janet.....12
Summer queen.....10		Spitzenberg (E.).....12
William's favorite.....10		Vanderere (N. Y.).....12
		Wagener.....11
		Ladies' sweeting.....10

Fifteen early, nine medium, and seventeen late varieties.

All or nearly all of these forty-one varieties should be grown by everybody, either for taste or profit. The early harvest seems the de-

cidedly preferred variety for summer, the rambo for autumn, and the Jonathan for winter. Of the forty-one, eleven were recommended by Coxe, in 1817, or half a century since, for table use. The following are the varieties that have stood the fifty years' test:

Early harvest [Prince's harvest,]
Large yellow bough [Bough,]
Summer queen,
American summer pearmain [Early pearmain,]
Summer rose,
Maiden's blush,
Rambo,
Fall pippin,
Bellefleur, yellow,
Spitzenberg, esopus,
Newtown pippin.

Taking Great Britain, continental Europe, and America all into account, and we find the Gravenstein the most satisfactory to German, Briton and Yankee. The red Astrachan is a formidable rival.

In the United States we find varieties limited to certain latitudes or localities, by their inability to endure the changes sometimes required of them. The Cooper, according to Dr. Warder, can hardly thrive off of the Muskingum river. Rawle's janet, Milan, and perhaps other varieties, cannot succeed in the extreme north, because the season is too short for their maturing. The Ribston pippin, Roxbury russet, and others, do not succeed south, because the season is too long. Some varieties are tender in tree so as not to endure cold, as rambo, Baldwin and Belmont. Others do not seem to endure extreme heat. I think the early harvest may be one of these, and I find the northern spy mentioned as another. The result of all this is a considerable diversity of planting among cultivators north and south, east and west.

In northern localities we find perhaps more foreign varieties used than in the south. The Russian varieties, Alexander, Borovitesky, Bourassa (?), Duchess of Oldenburg and red Astrachan, seem eminently satisfactory for hardiness and healthiness, though their quality is not much extolled.

In the south we find more native seedlings and few or no foreign varieties; but the native sorts are said, many of them, to be of great excellence. Bohannan, fall queen and mangum are put down by Downing as first rate.

In Illinois, I find the Rawle's janet the most popular apple, for all purposes. The following list of five varieties, I find on the lists of a majority of cultivators in all parts of the state: Early harvest, Carolina, red June, red Astrachan, rambo, yellow bellefleur, winesap, Rawle's janet.

In Ohio I find the following varieties, in the Report of the Pomological Society for 1865, set down as successful throughout the state:

Red Astrachan, early harvest, early strawberry, fallowater, fall pippin, golden sweeting, Hubbardston nonesuch, Jonathan, large yellow bough, Lowell, maiden's blush, porter, rambo, red Canada, summer queen, summer rose, Vandevere of N. Y., winesap.

Our successful varieties in the west are generally those of the same latitudes east. This fact is general and must be a good deal qualified, but is still curiously true. Of ten apples recommended for southern Illinois, three are from New Jersey, two from Virginia, one from Kentucky, one from North Carolina, two (?) from New York, and one from Europe. Of the eighteen sorts mentioned above, as approved throughout Ohio, four came from New England, four from New York, three from New Jersey, one from Pennsylvania, one from Europe, and of five the origins are not given in the books.

Some varieties seem to vary a good deal under different conditions, or else there are sub-varieties arising from seedlings that are difficult to distinguish. There are claims made of two or more sub-varieties of Rambo, Rawle's janet, Carolina, red June, early harvest, American summer pearmain and Newtown pippin. It is known that some varieties reproduce themselves readily; a seedling orchard from the seed of the yellow bellefleuer is said to have produced good, bad and indifferent, early, medium and late fruit, but all of the belleflower type of fruit. The Ortley and Harwood are apparently seedlings of it. The Gilpin has many seedlings whose family likeness is unmistakable. I have seen an alleged seedling of the rambo that was nearly a perfect reproduction of the original; and the Fulton seems to me only a modified rambo.

The whole question of varieties, their production and modification by climate, soil or stock, is still unsettled, many points remaining undiscussed or in dispute, and but few settled.

The apple, as an ancient and widely spread fruit, is known in the mythology, legends, customs, poetry and prose of many nations. The apple of the Bible cannot be taken into the account, for the pyrus malus was not meant by the word so translated in the song of Solomon, and elsewhere.

The first allusion to our apple I find in Homer, although here, as elsewhere, the generic use of the word gives us trouble. Commentators, however, translate the Greek word in three places in the Odyssey as apple tree. Thus, in the seventh book we are told that in the garden of Alcinous "tall flourishing trees grew, pears and pomegranates, and apple trees producing beautiful fruit;" and in the eleventh of "pear trees, and apples, and pomegranates, producing beautiful fruit." In the twenty-fourth, Ulysses, in enumerating the gifts of his father, says: "thou gavest me thirteen pear trees, and ten apple trees and forty fig trees." On the other hand, the golden apples of the Hesperides are supposed to have been the orange. Herodotus, in his histories, speaks of the root of the lotus as of the "size of an apple," whence we may infer a familiarity on the part of himself and his hearers with that fruit.

In the later Greek writers allusion to the apple becomes frequent. Becker, in his Charicles, quotes Pollux, to the effect that the Greeks pinched fresh apple seeds between the tips of the two first fingers of the right hand, and if the seeds flew upward, they prognosticated success in love. An apple thrown to a person was an avowal of preference, as Theocritus and the authology suggest. Theocrites, in his sixth Idyll, enumerates the apple among the fruits of summer. "Pears indeed at our feet, and by our sides apples were rolling for us in abundance."

In the later Latin authors there is also considerable mention of the apple, particularly in Virgil. The word poma in his first eclogue ("sunt nobis mitia poma"), and in his seventh ("strata jacent passim sua quaque sub arbore poma"), is translated apples. He speaks of gathering them from hedges. He also mentions the apple as expressing preference in love. Abella, in Virgil and Tibur, in Columella, have the epithets "apple-bearing." Pliny, however, is the chief Latin writer who has touched upon the apple. He is said to enumerate twenty-three varieties. "Among the few that modern authors have recognized, the appiani of the Romans are supposed to be the appie or appiale of the modern Italians, the appia pyriformis to be the appiolona lunga, the Syriaca ruberrima to be the red Colvetto," etc. Appiani is said by Hogg to be regarded by some as identical with the api, or lady apple.

"In more modern Tuscany, Micheli describes fifty-six sorts under the Medici princes, fifty-two of which are figured by Costello."

I find little of early allusion to the apple in Germany or France, although there must have been an early culture of it in both. In Scandinavia, we come upon the mythological story of the apples of immortality as told in the Younger Edda. The story of the goddess Iduna, in whose keeping they were, and the stealing of them, is told in the Conversations of Bragi. It is said of her: "She keeps in a box the apples which the gods when they feel old age approaching, have only to taste of, to become young again. It is in this manner they will be kept in renovated youth until Ragnarök" (the twilight of the gods). This story may imply an early knowledge and use of the pyrus malus.

When we get into English history and literature, however, the allusions to this fruit, and information concerning it, greatly increase, and that, too, at an early date. Loudon says: "The apple Whitaker conjectures to have been brought into Britain by the first colonies of the natives, and by the Hædui of Somersetshire in particular; hence Glastonbury was distinguished by the title of Avellonia, or the apple orchard, previously to the arrival of the Romans. Before the third century, the fruit had spread over the whole island, and so widely, that according to Solinus there were large planters of it in the 'Ultima Thule.'" The Romans, according to Tacitus, began to plant orchards on their arrival, and found the soil and climate favorable to

the growth of all kinds of fruit except the grape. The Druids, Loudon tells us, "paid particular reverence to the apple tree, because the mistletoe was supposed to grow only on it and the oak; and also on account of the great usefulness of the fruit. The ancient Welch bards," he continues, "were rewarded for excelling in song by 'the token of the apple spray.'"

Out of one or more of these heathen faiths appears to have arisen the rites practiced in different parts of England, until a late period, if not to the present time. First of these we may mention the wassail bowl. "The glossary to the Exmore dialect," says the Every Day Book, "was 'watsail'—a drinking song on twelfth-day eve, throwing toast to the apple trees in order to have a fruitful year, which seems to be a relic of the heathen sacrifice to Pomona."

Loudon says: "The wassail bowl drunk in All-Hallowe'en, twelfth-day eve, Christmas eve, and on other festivals with the church, was compounded of ale, sugar, nutmeg and roasted apples, which every person partook of; each taking out an apple with the spoon, and then drinking out of the bowl. Sometimes the roasted apples were bruised and mixed with milk or white wine, instead of ale; and in some parts of the country apples were roasted on a string till they dropped off into a bowl of spiced ale beneath, which was called lamb's wool." The reason of this name, which is common to all the compounds of apples and ale, being given to the wassail bowl, is differently explained by different writers. Brand attributes it to the softness given to the liquor by the apples and sugar; but Vallancy says it arose from the lamb's wool being drunk on the 31st of October. All-Hallowe'en, the first day of November, being dedicated to the angel presiding over fruit, seeds, etc., and, therefore, called La Mas Ubal, that is, the day of the apple fruit, and this being pronounced lamasool, soon became corrupted by the English into lamb's wool. Shakspeare alludes to the custom of putting roasted apples in ale, in the Midsummer Night's Dream:

> "Sometimes I lurk in a gossip's bowl,
> In very likeness of a roasted crab;
> And when she drinks against her lips, I bob,
> And on her withered dewlap pours the ale."

So is there in the Confession of Faith, from Gammer Gurton's Needle:

> "I have no rost, but a nut browne toste,
> And a crab laid in the fyre;
> A little breade shall do me steade,
> Much breade I not desyre.
> No frost, nor snow, nor winde I trowe,
> Can hurte mee, if I wolde,
> I am so wrapt and throwly lapt
> Of jolly good ale and olde.
> Back and syde go bare, go bare,
> Booth foot and hand go colde,
> But belly, God send thee good ale y'noughe,
> Whether it be new or olde."

The wassail bowl, or its representative, was carried into the orchards on Christmas or twelfth-night eve, the authorities, and perhaps the custom, varying as to the time. The Every Day Book says: "In certain parts of Devonshire, the farmer, attended by his workmen, with a large pitcher of cider, goes to the orchard this evening (twelfth-night eve) and there, encircling one of the best bearing trees, they drink the following toast three times:

'Here's to thee, old apple tree,
Whence thou may'st bud, and whence thou may'st blow!
And whence thou may'st bear apples enow!
Hatsful! capsful!
Bushel—bushel—sacksful,
And my pocketsful, too! Huzza!'

"This done, they return to the house, the doors of which they are sure to find bolted by the females, who, be the weather what it may, are inexorable to all entreaties to open them till some one has guessed at what is on the spit, which is generally some nice little thing difficult to hit on, and is the reward of him who first names it. The doors are then thrown open, and the lucky clodpole receives the tit-bit as his recompense. Some are so superstitious as to believe, if they neglect this custom, the trees will bear no apples that year." To the preceding particulars, which are related in the Gentleman's Magazine for 1791, may be added that Brand, on the authority of a Cornishman, relates it as a custom with the Devonshire people to go, after supper, into the orchard with a large milk pan full of cider, having roasted apples pressed into it. "Out of this each person in the company takes what is called a clayen cup—that is, an earthernware cup full of liquor—and, standing under each of the more fruitful apple trees, passing by those that are not good bearers, he addresses it in the fol lowing words:

'Health to thee, good apple tree,
Well to bear pocketfuls, hatfuls,
Peckfuls, bushel-bagfuls!'

And, then, drinking part of the contents, he throws the rest, with the fragments of the roasted apples, at the tree. At each cup the company set up a shout."

On the 25th of July—St. James' day—we are told by the Every Day Book, "apples were blessed on this day by the priest. There is a special form for blessing them in the manual of the church of Sarum." On All-Hallowe'en, according to the same authority, "young people, in the north of England, dive for apples, or catch at them when stuck upon one end of a kind of hanging beam, at the other extremity of which is fixed a lighted candle. This they do with their mouths only, their hands being tied behind their backs."

These time-honored observances and sports all attest the antiquity and importance of the fruit in England. According to the Pictorial History of England, the gardens and orchards attached to monasteries,

and mentioned at an early period of Anglo-Saxon history, produced apples among other fruits. Gardens, orchards and vineyards are mentioned in the Conqueror's survey.

Documents mention the Costard and pearmain in the twelfth century.

"In the beginning of the thirteenth century," says Loudon, "the apple appears to have been cultivated to some extent in Norfolk." In the sixth of King John (1205), Robert de Evermere was found to hold his lordship of Redhern and Stokesby, in Norfolk, by petty sergeantry; the payment of two hundred pearmains and four hogsheads (modios) of wine, made of pearmains, into exchequer, at the feast of St. Michael's, yearly." Pippins were introduced about 1525, says the Pictorial History. Another author has it 1572. Tusser, in his Hundred Points of Good Husbandry, speaks of "all sorts of apples," and makes various pleasant allusions to the fruit, and gives some sound advice which he probably did not practice:

"Cheese, apples and nuts, jolly carols to hear,
As then in the country is counted good cheer."

"The moon in the wane gather fruit for to last,
But winter fruit gather when Michel is past."

"Fruit gathered too timelie, will taste of the wood,
Will shrink and be bitter, and seldom prove good;
So fruit that is shaken, or beat off a tree,
With bruising in falling, soon faultie will be."

Authors on the subject begun to appear about the time of Queen Elizabeth. Gerard, in his Herbal (1597), enumerates and figures "the pome water, the Baker's ditch, the king of apples, the quiuning or queene of apples, the sommer pearmaine" and "the winter pearmaine." The Husbandman's Fruitful Orchard, published in the same year, are pippins, pearmaines, John apples, winter russetings and leathercoats. Shakespeare mentions pippins, leathercoats, apple Johns, and perhaps other sorts. Googe, in his Husbandry (1614), speaks of pippin, romet, pomeroyall and marigold.

Parkinson, who, in 1614, published his Paradisi in sole Paradisius Terrestris, is, according to Hogg, the first author of value in this respect. He enumerated fifty-nine varieties with "twenty sorts of sweetings, and none good."

Gervase Markham, quoted by D. G. Mitchell, gives in his edition of the Maison Rustique (1616), some advice intended to be sage on apple planting and culture. The apple, he says, "loveth to have the inward part of his wood moist and sweatie, so you must give him lodging in a fat, black and moist ground; and if it be planted in a gravelly and sandy ground, it must be helped with watering and vatting with dung and smal mould in the time of automne. It liveth and continueth in all desirable good estate in the hills and mountains where it may have fresh moisture, being the thing that it searcheth after, but even there it must stand in the open face of the south." I prefer to

put this in here as a literary curiosity rather than later as practical advice. It reads very much like the following from Burton, a little later, when discoursing of the causes of melancholy: "Laurentius approves of many fruits in his Tract of Melancholy, which others disallow, and among the rest apples, which some likewise commend, sweetings, pearmains and pippins as good against melancholy."

John Phillips, who lived in the last quarter of the seventeenth century, and wrote a parody on the style of Milton, composed a poem on cider, which I have seen only in extracts, after the manner of the Georgics:

"What soil the apple loves, what care is due
To orchats, timeliest when to press the fruits,
Thy gift, Pomona, in Miltonian verse
Adventurous I presume to sing; of verse
Not skilled, nor studious; but my native soil
Invites me, and the theme as yet unsung."

He commends

"The pippin, burnished o'er with gold, the moyle
Of sweetest honied taste; the fair pearmain,
Temper'd like comeliest nymph, with white and red;"

but is especially emphatic in his praise of the red-streak:

"Let every tree in every garden own
The red-streak as supreme, whose pulpous fruit
With gold irradiate and vermillion shines.
Hail Herefordian plant! that dost disdain
All other fields."

The allusion to Hereford is followed by Scott:

"And apple groves deck Hereford's golden vales."

Thompson, in the Seasons, did not omit the orchard and apple from catalogue of rural pictures:

"The breath of orchard, big with bending fruit,
Obedient to the breeze and beating ray,
From the deep-loaded bough a mellow shower
Incessant melts away. The juicy pear
Lies in a soft profusion scatter'd round;
A various sweetness swells the gentle race,
By nature's all-refining hand prepared,
Of temper'd sun and water, earth, and air,
In ever changing composition mixed;
Such, falling frequent through the chiller night,
The fragrant stores, the wide-projected heaps
Of apples, which the lusty-handed year,
Innumerous, o'er the blushing orchard shakes,
A various spirit, fresh, delicious, keen,
Dwells in their gelid pores."

To return to authors professionally, pomological, we need not delay until we reach William Forsyth, who, in 1801 (?), published the

first edition of his Treatise on the Culture and Management of Fruit Trees, in which he enumerates (in the fifth edition, 1810), one hundred and ninety-six varieties. The edition of 1801 (?) was published at New York in 1802, with a preface by William Cobbett. In this only forty-four varieties are given by number and about sixty others printed without order. An epitome of it, published at Philadelphia in 1804, omits the apple entirely.

Lindley's Guide to the Orchard (1831), enumerates and describes with considerable minuteness two hundred and fourteen varieties, and was probably a great advance on all prior English works.

Robert Hogg published his work on the apple in 1851. This enumerates, describes, and, to some extent, gives the outlines of 942 varieties—the largest number described in any book in the English language. This work, with its hints on classification, may be also regarded as the most complete handbook in our tongue.

"The introduction of the common apple tree into the British North American colonies," says the Patent Office Report for 1853, "dates back to the early period of their settlements. The seeds of apples and various other products were brought from England at the order of the governor and company of Massachusetts bay of New England, in 1629. On the 3d of April, 1632, Governor's Island, in Boston harbor, was granted to Governor Winthrop on condition that he should plant thereon a vineyard or an orchard. Apples were cultivated near Plymouth by the Pilgrims, soon after their arrival, and some of the original trees were standing there up to within a few years.

"The first orchard planted in Rhode Island was at Study Hill, near Pawtucket, by Rev. William Blackstone, in 1636. It contained an apple by the name of yellow sweeting, famous in that day.

"The apple was planted in Hartford, in Connecticut, previous to the year 1645. An ancient tree of the pearmain variety is still standing on the Charter Oak place, in that city, which was brought from England, by George Wyllis, more than two hundred years ago.

"In 1741 apples were exported from New England to the West Indies in considerable abundance. Prior to that period one hundred hogsheads of cider were made from a single farm.

"The common apple was grafted on wild crab stock in Virginia, in 1647. The same year twenty butts of cider were made in that colony by Richard Bennet.

"A codling tree, sent from England about a century ago, by Charles Lord Baltimore to his son Benedict Calvert, is now standing in full vigor at Mount Airy, Prince George's county, in Maryland.

"It appears from Dodeley's London Annual Register, that in the year 1768 the society for promoting arts, etc., at New York, awarded a premium of £10 to Thomas Young, of Oyster bay, for the largest nursery of apple trees, the number being 27,123."

Palfrey, in the History of New England, says that in the early settlement, "the apple tree, set out in extensive orchards, soon produced

a fruit far superior in size and flavor to what it had borne on English ground."

Du Pratz, in his History of Louisiana, published in 1758, says: "There are plenty of wild apples in Louisiana like those in Europe, and the inhabitants have got many kinds of fruit trees from France, such as apples, pears, plums, cherries, etc., which, in the low grounds, run more into wood than fruit. The few I had at the Natchez proved that high ground is much more suited to them than the low."

The Indians caught the infection. Schoolcraft, in his Report on the Iroquois, says the Cultivator for 1847, observes in relation to the fondness of the Indians for the apple: "From the earliest introduction of the fruit into New York and New France from the genial plains of Holland and Normandy, these tribes appear to have been captivated by its taste, and they lost no time in transplanting it, by sowing the seeds, to the sites of their ancient castles." General Sullivan, in his expedition up the Susquehannah in 1779, destroyed apple and other fruit trees belonging to the hostile Indians.

The first native book in America is the View of Cultivation of Fruit Trees in the United States," etc., by William Coxe, Philadelphia, 1817. This work enumerates 133 varieties of apples, and gives engravings of 100 that are in many cases accurate likenesses. Considering the time of its publication and the attending drawbacks, we must pronounce it a wonderful book. I have seen somewhere the story that the accurate drawings of this work were due to the patient industry of his two daughters, who painted them in water colors. The fourth edition of John Ludwig Christ's Obstbaumzucht and Obstlehre, published in the same year, though more scientific, seems to me otherwise no better.

After Coxe, fruit books increased. Thatcher's American Orchardist is said (I never saw it) to have been published in 1825, Kenrick's New American Orchardist in 1833. This, in the edition of 1844, describes 125 varieties, and is a good book, though without drawings. Downing's Fruit and Fruit Trees of America, the great authority, came in 1845. The edition of 1857 describes 626 varieties. Thomas' American Fruit Culturist, the best in its method of all American works, came in 1847, but this did not describe many varieties. Cole's American Fruit Book came in 1850, and is, undoubtedly, the most concentrated of all. It describes 177 varieties. Elliott's Fruit Guide, 1855, introduced the useful practice of showing the insides of apples as well as their outlines. The second edition of 1860, under the name of Elliott's Western Fruit Book, contains descriptions of 683 varieties. Hooper's Western Fruit Book, 1857, cannot be praised. It has neither method nor connection. Just now the pomological world is on the qui vive for the long expected work of Dr. Warder, whose long study and observation, and well known ability, justify the most favorable anticipations. This work, like Mr. Hogg's, is to be devoted to the apple alone.

American poets have not disdained to sing the praises of the apple, or even, as in the following lines from Dr. Holland's Bitter Sweet, its varieties. The scene is laid in a New England cellar:

"That is a barrel of russets; (Roxbury)
But you can hardly discuss its
    Spheres of frost and flint
Till, smitten by the thoughts of spring
And the old tree blossoming,
Their bronze takes on a yellower tint,
And the pulp grows mellower in't,
    But oh! when they're sick with the savors
        Of sweets that they dream of,
    Sure all the toothsomest flavors
        They hold the cream of!
You will be begging in May,
In your irresistible way,
For a peck of apples in gray.

"Those are the pearmains [blue] I think—
Bland and insipid as eggs;
They were too lazy to drink
        The light to its dregs,
And left them upon the rind—
A delicate film of blue—
Leave them alone:—I can find
Better apples for you.

"Those are the Rhode Island greenings:
Excellent apples for pies;
There are no mystical meanings
    In fruit of that color and size.
They are too coarse and too juiceful;
They are too large and to useful.

"There are the Baldwins and Flyers, [?]
Wrapped in their beautiful fires;
Color forks up from their stems
    As if painted by Flora,
Or as from out the pale stream the flames
    Of the Northern Aurora.

"Here shall our quest have a close:
Fill up your baskets with those!
Bite through their vesture of flame,
    And then you will gather
All that is meant by the name,
    Seek-no-further."

The following is a very pretty figure of original sin:

"The native orchards' fairest trees,
    Wild springing on the hill,
Bear no such precious fruit as these,
    And never will,

"Till ax and saw and pruning knife
    Cut from them every bough,
And they receive a gentler life
    Than crown them now."

But I confess to liking Shakspeare better:

> "You see, we marry
> A gentleman scion to the wildest stock
> And make conceive a bark of baser kind
> By bud of nobler race! This is an art
> Which does mend nature—change it rather; but
> The art itself is nature."

THE CLASSIFICATION OF THE APPLE.

One result of the great multiplication of varieties is that attention has been turned to arranging varieties in classes for greater ease in identification; and we find numerous efforts made by pomological authors in that direction. In these attempts, the principal trouble, apparently, has been to find a natural arrangement based on the permanent characteristics of all varieties of apples, and it seems yet questionable whether any such basis can be found in the changeable features of mere varieties. Theoretically, one would say that we should collect all the known wild species of the apple, examine their characteristics, and test the quality and variability of their respective descendants, and then endeavor, by comparison of tree and fruit, to classify our existing varieties by their parentage as a first division. To the pyrus malus Astracanica, we could perhaps refer the red Astrachan, white Astrachan, and other Russian varieties. The class of "rosenapfel" contains the most of them. But whether any serious attempt at investigation has been made in this direction, I am unable to learn from the authors within my reach.

The original classification of apples would of course be according to the peculiarities that most struck the senses. An apple would be classed as it seemed to the sight as large or small, red or yellow, round, flat or oblong, and according to its taste as sweet or sour. Thus, the early English apples are called pearmains, pippins, russetings, leathercoats, etc. Forsyth, writing about the beginning of the present century, makes no attempt to classify.

Manger, according to Christ, first attempted a systematic classification of fruits, and arranged the kernel fruits (apple, pear and quince) according to their shape. Sickler, whose Deutsche Obstgärtner was published 1794–1804, had also a classification, but I have seen no account of it.

Christ, in his Handbuch über die Obstbaumzucht, etc., 1817, gives the following classification:

A. Calvilles:
  a Perfect.
    1. Yellow; as the Gravenstein.
    2. Red and striped; as pomme d'Etiolle.
  b Imperfect; as Mela de Rosmarino.
  c Rose apples; as white Astrachan.

B. Reinettes; as Dutch mignonne.

C. Pippin; as Newtown pippin.
D. Pearmains; as Herefordshire pearmain.
E. Ribbed apples:
a Completely ribbed; as winterpostof.
b Ribbed about the eye; as lady apple.
F. Flat apples; as pomme violette (?)
G. Conical apples; as the bohnapfel.
H. Round apples; as rothe Stettinger.

Besides the apples contained in these eight classes, Christ enumerates a few as not yet classified.

This scheme is faulty, in that it is not consistent with itself. The first four classes are based on something like natural features; the fifth on the appearance of a horizontal section, and the three last on the appearance of a vertical section.

Diel's system comes some years later, and his classification is given by Hogg as follows. I omit details for want of room:

A. Ribbed apples:
a True Calvilles; as Gravenstein.
b Imperfect Calvilles; as winterpostof.
c Gulderlinge; as yellow bellefleur.
B. Rose apples:
a Tapering or oblong; as early red Margaret.
b Round or flat; as red Astrachan.
C. Rambours:
a With wide cells; as Alexander.
b With narrow cells; as rother Cardinal.
D. Reinettes:
a Self-colored; as Kentish fill-basket.
b Red; as Margil.
c Gray; as Sykehouse russet.
d Golden; as Dutch mignonne.
E. Striped apples:
a Flat; as luiken-apfel.
b Tapering; as birnformiger apfel.
c Oblong.
d Round; as grosser Rheinischer bohnapfel.
F. Tapering apples:
a Oblong, cylindrical, or conical; as Luxemburger reinette.
b Tapering to a point.
G. Flat apples:
a Purely flat; as rother Stettiner.
b Round-shaped flat apples; as winter citronenapfel.

Diel so qualifies the last two classes that they are not liable to the objection of being grounded on shape alone, which would make his analysis, also, inconsistent. He makes the characteristics of his "tapering apples" for instance, to be, "1. They have the cells regular; 2. They are not covered with bloom; 3. They are not striped, and are either of an

uniform color, or washed with red on the side next the sun; 4. Constantly diminishing to a point toward the eye; 5. They are sweet, or vinous, approaching a pure acid; 6. They do not decay readily."

Dochnal, in 1847, says Hogg, "published a system based upon that of Diel, of which it is a modification, and which possesses such advantages over its type as to be more easily reduced to practice." The following is an analysis, condensed:

A. Angular, or ribbed apples:
- *a* Quince-shaped apples.
  - I. Calvilles:
    1. Red.
    2. Two-colored.
    3. Yellow.
  - II. Bastard calvilles:
    1. Red.
    2. Two-colored.
    3. Yellow.
- *b* Pear-shaped apples:
  - I. Seeds loose:
    1. Self-colored.
    2. Two-colored.
  - II. Rambures:
    1. Cells wide.
    2. Cells narrow.

B. Spherical apples:
- *c* Medlar-shaped apples:
  - I. Roseapples:
    1. Oblong fruit.
    2. Round or flat fruit.
  - II. Reinettes:
    1. Self-colored.
    2. Red.
    3. Russet.
    4. Yellow.
- *d* Perfect, or apple-shaped:
  - I. Striped apples:
    1. Flat.
    2. Pointed.
    3. Oblong.
    4. Round.
  - II. Storing apples:
    1. Tapering.
    2. Flat.

In his British Pomology (1851), Mr. Hogg gives a system which is approved by the Handbuch der Obstkunde for its simplicity and practical utility. It is as follows:

A. Summer apples:

a Round, roundish or oblate:
1. Pale colored; as early harvest.
2. Striped; as Duchess of Oldenburg.
3. Red; as red Astrachan.

b Oblong, conical, oval or ovate:
1. Pale colored; as Keswick codlin.
2. Striped; as American summer pearmain.
3. Red; as king of the pippins.

B. Autumn apples:

a Round, roundish or oblate:
1. Pale colored; as gloria mundi.
2. Striped; as Gravenstein.
3. Red; as Hawthornden.
4. Russet; as Cornish aromatic.

b Oblong, conical, oval or ovate:
1. Pale colored; as yellow ingestrie.
2. Striped; as Alexander.
3. Red; as red ingestrie.
4. Russet; as pine apple russet.

C. Winter apples:

a Round, roundish or oblate:
1. Pale colored; as Rhode Island greening.
2. Striped; as Newtown Spitzenberg.
3. Red; as lady apple.
4. Russet; as Roxbury russet.

b Oblong, conical, oval or ovate:
1. Pale colored; as lemon pippin.
2. Striped; as Esopus Spitzenberg.
3. Red; as lady's finger.
4. Russet; as golden russet.

In the Handbuch der Obstkunde, 1858, is another modification of Diel's System, by Lucas, running as follows:

I. Calvilles:
1. Prime colored:
a With open calyx.
b With closed calyx; as white winter Calville.
2. Blushed:
a With open calyx.
b With closed calyx; as rother herbst Calvill.
3. Striped:
a With open calyx; as Gravenstein.
b With closed calyx; as gestreifter winter Calvill.

II. Bastard Calvilles:
1. Prime colored:
a With open calyx.
b With closed calyx; as gelber eckapfel.
2. Blushed:

a With open calyx.
b With closed calyx; as rother eckapfel.
3. Striped:
a With open calyx.
b With closed calyx; as prinzen-apfel.

III. Golden apples:
1. Prime colored:
a With open calyx; as königsapfel von Jersey.
b With closed calyx; as süszer Holaart.
2. Blushed:
a With open calyx; as Pile's russet.
b With closed calyx.
3. Striped:
a With open calyx.
b With closed calyx.

IV. Rose apples:
1. Prime colored:
a With open calyx.
b With closed calyx; as Englisher gewürzapfel.
2. Blushed:
a With open calyx.
b With closed calyx; as red Astrachan..
3. Striped:
a With open calyx; as Karoline Auguste.
b With closed calyx; as early red Margaret.

V. Pigeon apples:
1. Prime colored:
a With open calyx; as gelber Richard.
b With closed calyx; as Donauer's taubenapfel.
2. Blushed:
a With open calyx; as kleine yungfrauapfel.
b With closed calyx; as edelrother.
3. Striped.
a With open calyx.
b With closed calyx; as rother winter taubenapfel.

VI. Rambour apples.
1. Prime colored:
a With open calyx.
b With closed calyx.
2. Blushed:
a With open calyx.
b With closed calyx; as rother Cardinal.
3. Striped.
a With open calyx; as Alexander.
b With closed calyx; as beauty of Kent.

VII. Rambour reinettes:
1. Smooth skinned:

a With open calyx.
b With closed calyx; as Luxanburger reinette.
2. Rough skinned:
a With open calyx; as Pariser rambour reinette.
b With closed calyx.

VIII. Wax reinettes:
1. Smooth skinned:
a With open calyx.
b With closed calyx; as Emelie Müller.
2. Rough skinned.
a With open calyx; as Hürbin's pepping.
b With closed calyx; as Deutscher goldpepping.

IX. Borsdorf reinettes:
1. Prime colored:
a With open calyx.
b With closed calyx.
2. Blushed:
a With open calyx.
b With closed calyx.
3. Striped:
a With open calyx.
b With closed calyx; as Engelberger.

X. Red reinettes:
1. Blushed:
a With open calyx; as Marmoriter sommer pepping.
b With closed calyx.
2. Striped:
a With open calyx; as Multhaupt's reinette.
b With closed calyx; as Muskat reinette.

XI. Gray reinettes:
1. Prime colored:
a With open calyx; as graue herbst reinette.
b With closed calyx.
2. Blushed:
a With open calyx.
b With closed calyx.
3. Striped:
a With open calyx.
b With closed calyx.

XII. Golden reinettes:
1. Blushed:
a With open calyx.
b With closed calyx.
2. Striped:
a With open calyx; as Orleans reinette.
b With closed calyx; as grosse Carselu reinette.

XIII. Striped apples:

1. Rounded:
   a With open calyx.
   b With closed calyx; as luiken apple.
2. Conical:
   a With open calyx.
   b With closed calyx.
3. Ribbed:
   a With open calyx.
   b With closed calyx; as Echter winter streifling.

XIV. Conical apples:
1. Prime colored.
   a With open calyx.
   b With closed calyx.
2. Blushed:
   a With open calyx; as kleiner Fleiner.
   b With closed calyx; as Müller's spitzapfel.

XV. Flat apples:
1. Prime colored:
   a With open calyx; as Wellington.
   b With closed calyx; as winter citronenapfel.
2. Blushed:
   a With open calyx.
   b With closed calyx.

The only American author who has attempted a classification up to near the present time, is John J. Thomas, whose Fruit Culturist still remains in this, as well as in other respects, the most thoroughly systematized work yet published in America upon the subject. His division is as follows:

A. Summer apples:
   a Sweet:
      1. Striped; as red and green sweet.
      2. Not striped; as large yellow bough.
   b Not sweet:
      1. Striped; as Am. sum. pearmain.
      2. Not striped; as early harvest.

B. Autumn apples:
   a Sweet:
      1. Striped; as Jersey sweeting.
      2. Not striped; as autumnal Swaar.
   b Not sweet:
      1. Striped; as Alexander.
      2. Not striped; as fall pippin.

C. Winter apples:
   a Sweet:
      1. Striped; as Bailey sweet.
      2. Not striped; as Tallman sweeting.
   b Not sweet:

1. Striped; as Hubbardston nonsuch.
2. Not striped; as Newtown pippin.

This system has the great merit of simplicity, but is incomplete.

Dr. Warder, in his President's Address to the Ohio Pomological Society, in December, 1864, proposed another system, based upon shape, which will probably appear in his work on apples. This division is as follows:

I. Oblate or flat apples (vertical section):
  1. Regular (horizontal section):
    A. Sweet:
      a Self-colored, pale or blushed; as Haskell sweet.
      b Striped or splashed.
      c Russeted.
    B. Sour:
      a Self-colored.
      b Striped; as Baldwin.
      c Russeted.
  2. Angular, more or less ribbed or uneven:
    A. Sweet:
      a Self-colored; as Lyman's pumpkin sweet.
      b Striped.
      c Russeted.
    B. Sour:
      a Self-colored; as Fulton.
      b Striped; as Gravenstein.
      c Russeted; as Roxbury russet.

II. Conical; tapering toward the eye decidedly:
  1. Regular:
    A. Sweet:
      a Self-colored; as green sweet.
      b Striped; as Jersey sweeting.
      c Russeted.
    B. Sour:
      a Self-colored; as primate.
      b Striped; as Jonathan.
      c Russeted; as Bullock's pippin.
  2. Angular:
    A. Sweet:
      a Self-colored.
      b Striped.
      c Russeted.
    B. Sour:
      a Self-colored; as yellow bellefleuer.
      b Striped.
      c Russeted.

III. Globular, nearly spherical; the diameters equal:
  1. Regular:

A. Sweet:
a Self-colored; as summer sweet Paradise.
b Striped; as ladies' sweeting.
c Russeted.
B. Sour:
a Self-colored; early harvest.
b Striped.
c Russet.
2. Angular:
A. Sweet:
a Self-colored.
b Striped.
c Russet.
B. Sour:
a Self-colored.
b Striped; as Northern spy.
c Russet.
IV. Oblong; in which the axis is longer than the transverse diameter.
1. Regular:
A. Sweet:
a Self-colored.
b Striped; as Ramsdell's sweeting.
c Russeted; as English russet.
B. Sour:
a Self-colored; as Porter.
b Striped; as Esopus Spitzenberg.
c Russeted.
2. Angular:
A. Sweet:
a Self-colored.
b Striped.
c Russeted.
B. Sour:
a Self-colored.
b Striped; as William's favorite.
c Russeted.

I have attempted to illustrate the subsections by naming a specimen under each; but find it difficult to do so with the desirable accuracy.

These various attempts at classification are interesting, and will, if I am not mistaken, be found before long of considerable practical value.

The first point to be considered by the practical orchardist is the propagation of his trees. If, as is preferable, he grows his own nursery trees, it is the first thing in the order of time; if, as most must do, he is obliged to take trees from the nursery of another, he ought

to understand the proper mode of rearing them, lest he buy badly grown trees that may disappoint his expectations.

Apple trees are propagated by seed, suckers (as in the early history of the northwest), layers, cuttings (as in southern Chili), cuttings in the so-called Chinese method—made by forming a ball of earth about a limb of a tree, and keeping it moist until the limb strikes roots, by grafts and by budding. These various methods are but two in their essence. From seeds we raise a new plant, an offspring of the elder tree, differing from it more or less; from suckers, layers, cutting, grafts and buds we grow a part of the same plant, independent of its ancestor, by the aid of portions of the root of the original tree (sucker), by using the vital force of the original (layer), by making the conditions of growth specially favorable—as when we use bottom heat (cuttings)—or by cutting off the top of a third plant, and making use of its root (grafts), or root and more or less of its trunk (budding). Top grafting and budding are only these latter methods carried higher.

Raising fruit trees from seed is objectionable, because no certainty as to the quality or uniformity of the fruit has yet been arrived at; although there is a general tendency to produce apples of the same type as that from which the seeds were taken. Growing them from suckers, layers or cuttings, to say nothing of the difficulty and expense of the process, is not thought to produce the most desirable kind of root—they being too fibrous and too weak. Barry recommends mound layering, however, for Paradise and Doucain stocks. We are then reduced practically to budding or grafting, and our first business is to grow the stock. It is claimed upon general principles—I do not know that it has yet been experimentally proven—that seeds from the most hardy and vigorous trees will be most apt to produce similar seedlings; and the probabilities that such is the case are at least sufficiently strong to justify caution in the choice of seeds. It is probably best to take seeds of hardy, thrifty and long-lived sorts. In my own experience, I find the Pryor's red excellent in these three points. The Newtown pippin is long-lived, but somewhat slow and a little tender. Some recommend the Gilpin; but it is, as I have seen it, short-lived.

Apple seed should be frozen in winter, or otherwise put in a state favorable to quick germination; sown early in the spring on clean, warm and deeply plowed ground, and well cultivated.

There has been a good deal of controversy as to the respective effects of budding and grafting, and still more upon the merits of top grafting, collar grafting and root grafting. In the Cultivator for 1850, we find a statement of Prof. Turner, taken from the Horticulturist, "that sixty root grafted, one hundred grafted on full seedling roots, and sixty budded near the ground, were transplanted under precisely similar circumstances in similar soil. In the following year"

Of 60 root grafted, 6 were alive.
" 100 on full roots, 100 "
" 60 budded, 54 "

A very strong argument against root grafting. Mr. Phœnix, our great nurseryman, writing in the Prairie Farmer for 1852, says: "For one, I am inclined decidedly to the opinion that root grafted trees, as a general thing, are less hardy, thrifty and productive than seedlings, or stock grafts, more especially in hard, unfavorable soils or climates." Mr. Phœnix also states, in the same periodical (1860), that Mr. Galbraith, of Mount Vernon, Jefferson county, Illinois, "has tried many sorts of apples, both root grafted and top grafted, and finds but few that are not much more profitable when top grafted; some sorts seem almost totally barren when root grafted, while some few others seem equally good." Wm. Reid, in the first volume of the Gardener's Monthly (1859), says: "I cannot for a moment doubt that if a vigorous, strong rooted tree is desirable in an orchard, that those grafted or budded on wild seedling stocks, eight to ten inches above ground, are far superior to those propagated by grafting on pieces of the roots."

The above are testimonies against root grafting. On the other hand we have such as the folowing: In the Country Gentleman for 1859, the editor, alluding to some experiments made by him, denies that he could "perceive any difference in the character, growth or productions of trees grafted or budded in the nursery row, a foot above ground, and such as had been root-grafted into whole or bisected one and two year old roots." In Tucker's Rural Affairs, vol. 2, it is stated that "except in the severe winters of the northwest regions of the Union, where root-grafted trees are apt to be injured by the freezing and thawing at the surface, they are as good as when propagated in any other way, according to many careful and frequently repeated experiments." In the Ohio State Pomological Society's Transactions for 1854, are some facts concerning the longevity of root-grafted trees. Mr. Humrickhouse stated that of seventy trees set by him in 1833, twenty-one years before, he had lost none except by accident. Mr. Miller spoke of orchards planted near Dayton from root-grafted trees, from Heick's nurseries; for thirty years he never heard of any failure of orchards there.

The Gardener's Monthly for June, 1864, contains the following, which is probably a pretty correct summing up of the whole matter in controversy between root-grafting and stock-grafting: "Root-grafted apple trees are as good as trees grafted or budded on seedling stocks. The objection to them is more hyperthetical than to be discovered in practice." After some years of observation of trees raised both ways, we find the following facts:

First—As a rule, root-grafted trees come into bearing abundantly, earlier than budded trees and do not live quite so long, but the differ-

ence is very little, and on this head we should give the preference to root-grafted trees.

Second—The roots of root-grafted trees never extend so far as trees otherwise raised, but they are much more fibrous, and furnish quite as much food to the trees as the others. The tree is not, therefore, injured in its growth by this method of propogation, but is more liable to lean over in heavy rain and wind storms than trees with long main roots. This is a point against root-grafting.

Third—The fibrous nature of the roots favors successful transplanting. All other circumstances being equal there will be fewer deaths among transplanted root grafts than budded trees.

Fourth—Root-grafted trees, during the first few years of their existence, are hardier than budded ones. Whenever the thermometer goes below zero the very vigorous shoots on strong budded stocks will often split, when root-grafted ones of the same variety, side by side, being less vigorous, escape.

A subordinate question to that of root-grafting, is that of grafting on the whole or a part of the root. This question was discussed by the Illinois state horticultural society, at their meeting in 1858. Mr. Phœnix thought whole roots the best. Mr. Ellsworth had tried lateral roots, and signally failed. Used cuts of main roots three inches long, and found that sufficient. Mr. Bryant liked the second "cut" as well as the first. Mr. Minkler had kept the different cuts separate, but could see no difference in the nursery growth. Mr. Howell cut roots into four sections, keeping the different sections separate. The trees worked on the second cut were best; the remainder nearly equal. Mr. Galusha mentioned a similar experiment of one hundred trees grafted on each cut. The second cut made the best trees, the third next, the first next, and the fourth poorest of all.

In the Country Gentleman for 1859, it is stated that at a meeting of the fruit growers' association for western New York, H. E. Hooker "stated that he had experimented fully, by placing the upper and lower portions of the root after grafting separately, and could not perceive any difference between them when grown or between those and whole roots."

Double-working the apple is sometimes recommended, not only in the case of dwarfs, but sometimes to get a given graft on a given stock, in common grafting. Dr. Masher, in the Cincinnati horticultural society, recommended that the yellow bellefleur be grafted on the janet, in order to insure the fruiting of the former. Budding and top grafting are also recommended for some varieties, for the attainment of greater productiveness in some cases, and for hardier stocks in others. It has in several instances been found that the yellow bellefleur budded was productive, when as a graft it was not. This means, I presume, that the bellefleur makes naturally too rank a wood growth, and that the checking of it favors the formation of fruit buds. It is claimed that the Rhode Island greening, fall pippin, rambo, early har-

vest and red Astrachan succeed better, top-grafted, in one part or another of Illinois. All these except the last, which may perhaps be classed with the yellow bellefleur, are tender varieties on our prairies, and, according to Dr. Redfield, soft-wooded. In these cases the stock may induce less rapidity of growth, and earlier maturity and greater hardness of wood in the graft, by a similiar checking of growth. Such a precaution may not be required in many localities. It is one of the many shifts whereby the skillful cultivator will attain his ends in the face of a difficulty that at first seems insuperable, but rightly understood, is of but trifling moment. For planting in the latitude of St. Louis, I find two year old grafts the best; yearlings are too small to endure orchard culture, and three year olds, if well grown, are too large to be easily transplanted without injury.

Before proceeding to plant we must choose our site, and prepare the ground. The choice of an orchard site is a very important matter, especially when fruit is to be grown in large quantities for market, involving the outlay of considerable capital, and several years' interest thereon. Different latitudes necessitate different rules, in this as well as other respects. The nature of the soil in which a tree is to grow, and the kind of atmosphere in which it must extend its branches and put forth its leaves and fruit, are the two important considerations.

As to soil, perhaps Coxe's test is as simple and complete as any. Any soil that will produce good wheat and good clover, is fit for an apple orchard. In Illinois this is found generally to be in the river counties of the Mississippi, Illinois, etc., rather than in the black soiled prairies of the interior. The white soil of southern Illinois is almost everywhere a good wheat and fruit soil, but here the prairies are generally small and woodland abundant. In our Illinois clays there is I am told a good deal of gypsum, making a very rank and thick growth of clover, and propitious also to fruit. A clay soil should, however, not be impervious.

The more important question, perhaps, at least in the Mississippi valley, is the atmospherical conditions of an orchard. First of all, an orchard site should be elevated so as to avoid the lakes and currents of cold air that often destroy fruit buds and blossoms, and even trees in the valleys, and depressions of the surrounding country. In a climate like ours, subject to great humidity and occasional stagnation of atmosphere during the season of fruiting, elevation is also very important, because insuring more circulation of air, whereby the humidity is carried away in evaporation, and the attendant chillness of air so favorable to fungoid diseases prevented. The aspect of an orchard depends on climate. Coxe, and many writers after him, especially those of the northern United States, recommend a southern or southeastern exposure on a hillside, rather than upon its summit. In the west, in this latitude, when we have little variation of surface (our Geological Report says that the highest lands in the state of Illinois, between Freeport and Galena, are not more than nine hundred

feet above the level of the river at Cairo) we generally find it best to put our orchards on the summit of our highest elevations, with very little attention to aspect. We need not here pay that attention to securing a warm hillside for the maturation of our fruits that is needed in a shorter and colder season; nor are trees so much injured by winter winds in latitude 39° as in latitude 42° and 43°. Protection, however, is advantageous to a certain extent everywhere. Sites near large bodies of water that do not often freeze over are valuable, as on the shores of our great lakes and rivers. Natural or artificial shelters of trees, especially evergreens, are generally recommended, though in a hot, humid climate they may prove injurious in summer, by checking its sometimes languid circulation of air. Hollows running north and west, I have noticed, are sometimes injurious to orchards; at the head of them the winds from those points appear to drive the cold air above its natural level, just as winds from the sea drive waters into a bay. Planting clumps of evergreens at the mouths of such hollows would remedy the evil, at least in part.

The preparation of the soil in orchard planting is very essential to healthfulness and productiveness. Theoretically, thorough underdraining is prescribed by the books, but subsoiling is the more common practice of practical orchardists. Subsoiling to the depth of eighteen or twenty inches I find attended with the best results, especially in the rich prairie regions where the clay is considerably below the surface, and when the surface soil is not the most propitious for fruit growth. Thorough plowing is about the best and the only necessary preparation, unless the soil is naturally unfit for an orchard. In my own observation I have found old and worn lands better than new and fresh soils for the apple, even in timbered regions; but this may apply only to the grossly fertile lands of the west. When from any cause the orchard site cannot be plowed wide rather than deep, holes should be dug, and the ground afterward plowed as deeply as possible.

The varieties proper to plant depends on several considerations, such as the following:

Is the orchard for market or family use? If for family use alone, the number of trees is small, the amount invested small, and the cost of growing inconsiderable. In this case we look to what we like best, without much regard to large crops or showy fruits. As a list of well known and generally approved varieties of this kind, the following may be suggested for the St. Louis region:

1. Early harvest.
2. Large yellow bough.
3. Carolina red June.
4. American summer pearmain.
5. Porter.
6. Rambo.
7. Yellow bellflower.
8. Jonathan.
9. Pryor's red.
10. Newtown pippin.
11. Winesap.
12. Rawle's janet.

If the orchard is a commercial one, we have to consider (1) the

market to be supplied; (2) the means of transportation, and (3) the other sources of supply with which one must compete. The market to be supplied will generally have peculiar tastes. Chicago having a large population of New England and New York origin, generally prefer apples that are standard varieties in the east, especially for winter. This fact gives such varieties as Rhode Island greening, Roxbury russet and Baldwin, an advantage in that market over better varieties that are less known. In the St. Louis market, on the other hand, the yellow bellflower, Rawles' janet, Pryor's red and Newtown pippin, are varieties more familiar to purchasers. The means of transportation must be considered—whether by wagon, rail or water—in order to determine whether fruit of their skin and tender flesh will endure carriage. Again we must know our rivals in the market. Can they get in earlier varieties sooner than we? Then we must grow so many early apples. Do they raise better keepers than we? Then grow fewer winter varieties.

In a commercial orchard we want, so far as not inconsistent with other desirable qualities, the following characteristics of tree and fruit:

A. The trees should be
   1. Hardy.
   2. Early in coming into bearing.
   3. Productive.
   4. Of good shape, so as to be easily picked.

B. The fruit should be
   5. Of bright color.
   6. Of good and even size.
   7. Of fair quality.
   8. Ripening early.
   9. Hanging on the tree well without dropping.
   10. Free from insect and fungoid attacks.

Attaching an equal value to each of these points, we have a scale of ten to which we can apply any apple we are acquainted with and test its value as a market apple. For instance, in my own experience I find:

Early Harvest—Has 7 to 8 points in its favor. It is a little tender in tree; not very productive, and somewhat subject to scab (Dr. Peticolas, of Ohio, indicates that this is caused by cold nights when the fruit is young), but as the first apple of the season, and peculiar of early apples for its quality and evenness in ripening it, atones for these defects.

Red Astrachan—I put about 7 thus far, though further experience may raise my opinion of it. It is not very productive, early in bearing, nor even in ripening, but is very hardy, hale, big and beautiful.

Carolina Red June—I mark at 7 under high culture; with plenty of manure and the fruit thinned it can be marked at 9. Nothing is handsomer as a fruit, and the tree is fit to adorn a lawn. As ordinarily

cultivated it fails in size and health of fruit, and is always very uneven in ripening.

American Summer Pearmain—Has not been very productive with me yet on account of its very fine quality. I have still hopes that, as an old tree, it may prove a success. I mark it about 9.

Early Strawberry—Though tender-fleshed is one of the handsomest, best and most productive of its season (nearly that of the red Astrachan). Tree very vigorous. I mark it about 8.

Summer Queen—Is a very handsome apple. Its flavor to me is rank and not pleasant, but many like it. It is a rapid and handsome grower. It will stand about 8. The tree, I think, is not very enduring, and the fruit somewhat subject to scab.

Duchess of Oldenburg—Is a very hardy variety, handsome and productive far into the north. With me, so far as tested, it is threatened with a kind of watery rot, that I am inclined to attribute to its having come south of the latitude of its best success. The apple is third rate. Mark 8.

Hawthornden—As a full, early bearer, surpasses any other apple I have seen. Trees I planted in 1862 bore a peck of apples each in 1865. The apple is excellent for cooking, and of large size; but of no value as an eating apple. This I regard as a great objection. Commercial apples ought not to depend on any one fitness; they ought to be fit for eating, cooking, and in the late season for cider. Hawthornden comes earlier than the maiden's blush with me, and may be marked about 8.

Jersey Sweeting—If sweet apples are ever profitable for market, out to succeed. The tree bears well and the fruit is fine. It drops too easily. I mark it 8.

Porter—I find in my region invariably fair, of good even size and uniform appearance, and very good in quality. The fruit seems well distributed in the tree. The tree I find marked as a little tender in northern Indiana. I would mark it 9.

Maiden Blush—Is to me not entirely satisfactory as a tree, but its fruit is handsome and large enough, with no decided flavor to offend, to make it the perfection of a market apple. I have not experience or observation enough of it, but so far as I know would reckon this apple at 9.

Wine—Hay's winter, or as I know it, Pennsylvania redstreak, has a rather tender tree, but is productive, and the fruit not only large and handsome, but excellent alike for cooking and eating. I put it at 9.

Yellow Bellefleur—Has the grave fault, in many places, of late and sparse bearing, but its fine quality, and handsome appearance as a fruit, override even these objections, and I put it down at 8.

Jonathan—Stands the highest of all winter apples on the list of the American pomological society, and is a great favorite in northern Illinois. With me it has borne early; the fruit so far is of good size, and beautiful color, but ripens and drops too early for any but an early winter apple. I mark it 9.

Rambo—The old favorite, the conservative apple, I have not found profitable as a market apple. It is uneven in size and dull in color, and drops too much. I mark it about 7.

Roxbury Russet—Though so much grown in New England, New York, Michigan and Ohio, is here south of its proper latitude, and becomes a late fall or early winter apple of negative flavor. I can hardly understand why it should have remained so long a favorite in southern Ohio.

Smith's Cider—Has the reputation of being a tender tree, and I do not like the quality of the fruit, but it is very productive, handsome, and fair. I mark it at 9.

Pryor's Red—Has been a very hardy, vigorous and long-lived tree with me, and the fruit is invariably free from worms and disease, and of superior quality; but it is not an early or very productive tree. I mark it 8 as a market fruit, and shall plant more of it.

Ben Davis—I know little of personally. Its reputation is first rate in every respect but two. It is only third rate, and this far south is not a late keeper; but even here I would mark it 9, and in northern Illinois 10, as a market apple.

Winesap—Is a great favorite everywhere west. It is not persistent enough in hanging to the tree, and I have seen indications of scab upon it; but it is productive and good. I would mark it 9.

Newtown Pippin—Has probably found its best place in the limestone soils of southern Illinois and Missouri; rather late in coming into bearing; not very productive, and somewhat subject to scab. It has a good many points against it, but its one merit, of being the best apple, covers a multitude of sins, and I shall extend its culture on that consideration. I put it about 7, as a market fruit.

Rawle's Janet—Is the most popular apple in the state of Illinois, and probably throughout the west, and taking my own experience as a guide, I should mark it 10, as a market fruit. In 1856 I gathered 600 bushels of saleable apples, besides fallen and refuse, from an acre of fifty trees, fourteen years planted—an average of twelve bushels to the tree. The tree blossoms late, and escapes frosts. It bears good crops year after year. It will freeze on the tree, thaw out and be rather better than it was before. It needs a long season to mature, and probably does not ripen thoroughly much north of this latitude in most seasons.

Gilpin, or Little Romanite—Has some good qualities of hardiness, productiveness and firmness of fruit, but is a poor apple, and, but for its peculiar merit of long keeping, would not be tolerated. I put it about 8. It keeps well, as somebody has said even after it is eaten being about as indigestible as any apple that has friends.

Willow Twig—I have but just fruited. Thus far I do not find it satisfactory. It is, more than other varieties, attacked by the codling moth, and does not keep as well as its reputation would lead one to expect.

American Pippin, or Grindstone—I find about the best in quality of the late keepers, but exceedingly unproductive.

In an orchard of 3000 trees, set in 1863, I have planted about equal numbers of the following forty varieties, intended to cover the whole season of apples. One-half of the varieties, alternate rows, are to be removed at the end of fifteen or twenty years:

Permanent.	Temporary.
Early harvest.	Keswick codlin.
Deterdeng's early.	Primate.
Red Astrachan.	Carolina red June.
Early strawberry.	Sweet June.
Sops of wine.	Summer queen.
American summer pearmain.	Benoni.
Porter.	Trenton early.
Maiden's blush.	Buckingham.
Rambo.	Wine.
Yellow bellefleur.	Hubbardston's nonesuch.
Fulton.	Rome beauty.
Swaar.	Dominie.
Pryor's red.	Jonathan.
Ortley.	Fallowater.
White winter pearmain.	Milam.
White pippin.	Smith's cider.
Ben Davis.	Winesap.
Lady apple.	Michael Henry pippin.
Newtown pippin.	Rawle's janet.
Willow twig.	Gilpin.

Among permanent trees it was intended to include those varieties that are either long-lived, large-sized trees, or those that have good sized fruit when old; while among the temporary trees were put the small and short-lived sorts, or those whose fruit from old trees is small and defective.

Orchards are sometimes planted for cider only. Howe's Virginia crab, I am told, grows and bears well in this neighborhood, and as long ago as Coxe's time, now fifty years since, it was reputed, as now, the best cider apple. Harrison I do not hear so favorable a report of; Campfield is little tried here; Gilpin is the favorite for cider; Pryor's red makes a good cider; cider from Newtown pippin is of light body; winesap is approved by Coxe. I have planted, but have not yet in bearing, Howe's Virginia crab, Harrison, Campfield and Gilpin for this purpose. Cider apples, it will be noticed, must be late autumn or winter varieties. Cider, made from early or midsummer apples, is too weak to make vinegar. Fruit that has had the full advantage of all the

summer and autumn heat has, of course, a much larger amount of saccharine matter.

Orchards for stock are sometimes planted, and, considering the cheapness of growing apples, it is strange the custom has not become common. According to the Cultivator of 1850, 200 to 300 bushels an acre may be considered an average product. The cost of growing is estimated by J. J. Thomas at two and a half cents per bushel, and he puts the average per acre at 400 bushels; now, apples have about the same nutritious value as potatoes, and, according to the Rural Register, 195 pounds of potatoes, that is, 195 pounds of apples, are equal to 100 pounds of hay, 280 of carrots and 56 of Indian corn. The nutritious value of apples, therefore, is half that of hay, one-quarter that of corn, and one and a half times that of carrots. If apples can be grown at two and a half cents per bushel, corn would have to be raised at ten cents, and carrots at one and two-thirds cents per bushel, to compete. Or, again, if 250 bushels per acre be an average yield of apples, corn should yield 62½ bushels, and carrots 375, and be grown at the prices given above, to come at the same cost as feed. On this basis, apples would compare favorably with most farm products in cheapness. Sweet apples are, of course, preferable for stock purposes. I have planted, partly from personal knowledge and partly from information, the following list for stock purposes primarily, but having also an eye to possible sales or cider making:

1. Sweet June.
2. Large yellow bough.
3. Golden sweet.
4. Jersey sweet.
5. Ramsdell's sweet.
6. Bailey's sweet.
7. Danver's sweet.
8. Broadwell sweet.
9. Green sweet (of Indiana).
10. Tolman sweeting.
11. Ladies' sweeting.
12. Gilpin.
13. Campfield.

How to plant an apple tree is a matter of detail. I have not time to go into it here; nor shall I notice at length the various ingenious methods of laying out an orchard so as to secure entire regularity and straight rows. The first thing to determine is the distance apart of the trees. The most common distance for apple trees is thirty feet. This is rather too great a distance for small and young trees, and not great enough for old and large ones. Upon our western prairies it is also found advantageous to plant orchard trees closely, for mutual protection. Hence, we have A. R. Whitney, of Lee county, one of our largest Illinois fruit growers, planting as closely as 12 to 16 feet, root pruning half the rows by a sharp coultered plow, and getting a pro-

ductive and short-lived set of trees, that are removed before the alternate rows have attained large size. M. L. Dunlap, another fruit grower, with 100 acres of orchard on the prairies, puts his trees at 20 feet. My own experience has led me to plant at 20 feet, with the design of thinning out so as to leave the old trees 40 feet apart. I find that trees planted 30 feet apart begin to touch branches in 20 years, and that the outside trees that have no competition in one direction bear a good deal the finest fruit. Hence, I think that in this climate, after a tree has become old enough to take care of itself, it will be better for the future health and vigor of tree and fruit to give it plenty of room.

Different varieties vary a good deal in size, and suggest different distances for each; but practically I would prefer to have uniformity of distance for greater ease in culture. Planting trees of the same variety in a square rather than in a row may be suggested as beneficial here as well as in peach orchards. I have not tried it, but it appears preferable.

Putting a stake about 5 feet long on each side of a young tree, to keep careless men and animals off of it, I have always found good economy. This can be done in planting at small expense. Leaning a tree to the southwest is a frequent practice to shield the tree from the afternoon sun and brace it against the southwest winds. D. R. Wier, of Lacon, Marshall county, Illinois, would even say, "lean your trees from 20° to 30° toward where the sun is at 2 o'clock, or about 10° west of south." The planting of an orchard, which often endures beyond the limit of human life, is something more than a matter of practical business. If we are young, we are mindful of the fact that old age may come upon us and these vigorous trees at once, and that our children and children's children may sport beneath their shade. If we are old, we remember that we must pass away, while they will endure a monument of our labors on earth. The good is not "interred with our bones." It is an humble fame among those we leave behind to have planted trees—an immortality to which every man who owns an acre of ground can aspire. I shall, therefore, ask no apology for inserting into a practical part of my subject the very beautiful poem of Bryant (although I cannot indorse planting apple trees in the sod):

THE PLANTING OF THE APPLE TREE.

Come, let us plant the apple tree.
Cleave the tough greensward with the spade,
Wide let its hollow bed be made,
Then gently lay the roots, and then
Lift the dark mold with kindly care,
And press it o'er them tenderly,
As round the sleepy infant's feet
We safely fold the cradle sheet;
So plant we the apple tree.

What plant we in this apple tree?
Buds, which the breath of summer days
Shall lengthen into leafy spray;
Boughs, where the thrush with crimson breast
Shall haunt and sing and hide her nest;
We plant upon the sunny lea,
A shadow for the noontide hour,
A shelter from the summer shower,
When we plant the apple tree.

What plant we in this apple tree?
Sweets for a hundred flowery springs,
To load the May wind's restless wings,
When from the orchard way he pours
Its fragrance through our open doors;
A world of blossoms for the bee,
Flowers for the sick girl's silent room,
For the glad infant sprigs of bloom,
We will plant with the apple tree.

What plant we in this apple tree?
Fruits that shall swell in sunny Irene,
And redden in the August noon,
And drop, when gentle airs come by,
That fan the blue September sky;
While children come, with cries of glee,
And seek them, when the fragrant grass
Betrays their bed to those who pass
At the foot of the apple tree.

And when above this apple tree,
The winter stars are quivering bright,
And winds go howling through the night,
Girls, whose young eyes o'erflow with mirth,
Shall peel its fruit by cottage hearth;
And guests in prouder homes shall see,
Heaped with the grape of Cintra's vine,
And golden orange of the line,
The fruit of the apple tree.

The fruitage of this apple tree
Winds, and our flag of stripes and stars,
Shall bear to coasts that lie afar,
Where men shall wonder at the view,
And ask in what fair groves they grew;
And sojourners beyond the sea
Shall think of childhood's careless day,
And long, long hours of summer play
In the shade of the apple tree.

Each year shall give this apple tree
A broader flush of roseate bloom,
A deeper maze of verdurous bloom,
And loosen, when the frost clouds lower,
The crisp brown leaves of thicker shower.
The years shall come and pass, but we
Shall hear no longer, where we lie,
The summer songs, the autumn's sigh,
In the boughs of the apple.

And time shall waste this apple tree.
Oh! when its aged branches throw
Their shadows on the ground below,
Shall fraud, and force and iron will
Oppress the weak and helpless still?
What shall the tasks of mercy be,
Amid the toils, the strifes, the tears
Of those who live, when length of years
Is wasting this apple?

"Who planted this old apple tree?"
The children of that distant day,
Thus to some aged man shall say;
And, gazing on its mossy stem,
The gray-haired man shall answer them:
"A part of the land was he,
Born in the rude, but good old times
'Tis said he made some quaint old rhymes
On planting the apple tree."

APPLE ORCHARDS AND APPLE PRODUCTS.

The cultivation of an orchard by stirring the earth, manuring, etc., is a vexed question with horticulturists; some advocating high culture, others moderate culture, and some no culture at all. These differences of opinion can mostly be reconciled by reference to a few facts that are not held in view by the disputants. The first and most important principle is, that all culture should be applied at such a season as to insure early ripeness of wood in the following season. Fall manuring and spring plowing are better than spring manuring and late summer cultivation. Another point is, that a loose, rich soil, if cultivated, will be more apt to start unseasonable growth than a compact and poor one. Another, that the more intense cold of a northern region will make mistakes in unseasonable culture much more disastrous than in a southern climate. Hence, we can understand the "bad luck" of unphilosophical cultivators—the tendency to put orchards in grass in Michigan, and the tendency to cultivate in southern Illinois.

It is laid down in the Country Gentleman (1866?) that "the annual growth is the best guide to treatment. There are very few apple or other orchards which, after reaching a bearing state, throw out annual shoots more than a foot or foot and a half long. The owner may lay it down as an unalterable rule that when his trees do not grow one foot annually, they need more manuring or cultivation, or both."

In this climate and soil, thorough cultivation without manure, at least in the growth of an orchard, is what seems to me the most successful. The best crop in a young orchard is corn planted in good season, so as to be "laid by" early. When a crop is not grown, a late fall or early spring plowing, followed by a late spring plowing, and a little subsequent harrowing to keep weeds down, I find answers a good purpose. Some prefer to sow clover in such cases, but I am

not entirely satisfied of its advantages, except for other reasons than those affecting true growth.

An orchard, after five or six years, becomes so well established that it can shift for itself; and, with no culture at all, will bear more fruit for a time than if over-cultivated and its energies concentrated on wood growth. I think it highly probable, however, that moderate culture every year throughout the life of a tree maintaining a constant but never excessive wood growth will produce the greatest amount of fruit of good quality in the long run.

Clean culture around the roots is a great safeguard against the borer, woolly aphis and various vermin, and should be maintained by digging about the trees, to the distance of a foot or more, in spring, and by scraping off any late weeds and grass in July.

Among extraordinary results of cultivation, I note the following: In the Cultivator for 1848 it is stated that "John Lewis, of Knox county, Ohio, says that in 1834 he set out a young apple tree of the variety known as Milam, and in 1864, twelve years from the time of transplanting, it bore thirty-five measured bushels of apples." In the same paper for 1852 it is stated that "Lewis Burtes, of Rochester, has a young orchard, set five years, single trees of which have borne, in one case, three and a half bushels of Baldwins, two and a half bushels of Rhode Island greenings, and half a bushel Roxbury russets—all of the first quality, and all owing to high and attentive culture."

The Massachusetts Plowman gives the measurement of four apple trees, set five years ago, when three years from the bud. The soil was of quite moderate fertility, the present circumference one foot from the ground is fifteen inches each. This rapid growth is owing to careful transplanting, mulching with strawy manure and peat, washing the stems with potash ley, and keeping the ground in good tillage.

In the Country Gentleman for 1857 are given the measurements of some ten year old apple trees, of Berry Aldrich, of Bureau county, Illinois:

Varieties.	Hight.	Breadth.	Circumference of Trunk.
Summer queen	18 feet	16½ feet	30 inches
Early harvest	15 feet	12 feet	22 inches
Rawle's janet	17 feet	13½ feet	23 inches
Yellow bellefleur	18—10 feet	19 feet	31 inches
Domine	18 feet	17 feet	26 inches
Sweet romanite	15 feet	17 feet	29 inches
Winesap	19 feet	17 feet	28 inches
Honey pippin	17 feet	20 feet	31 inches

The pruning of orchard trees is also a matter in which there is

great diversity of theory and practice, both as regards the hight of the trunk and skeleton, and form of top. Low heads are now being generally adopted on the prairies, and even in other situations. Trees with short trunks have of late years been extolled on the ground that they are less injured by high winds and hot suns, bear fruit earlier, and are easier to pick. It is argued by a minority, however, that high headed trees are more easily cultivated, ripen larger and finer colored fruit, and are less subject to stagnation of atmosphere and consequent fungoid, diseases of blight, rot, etc.

All things considered, I would give moderately low heads the preference, but would make it a point to prune off drooping limbs below, and preserve a horizontal or upward growth of the lower branches.

As to the form of the top, it may be grown with or without a leader. A tree grown with a leader requires nearly the pruning specified for pyramids, in the books. The trunk extends upward and puts out side branches, horizontal or nearly so, and, so far as practicable, the branches are all laterals of this leader. A tree grown without a leader has a more or less hollow center, and three, four, or more main branches, on which the subordinate ones are distributed. Having noticed in old orchards, as generally pruned, that the crotches formed by these main branches, when the leader is cut out, retain dampness or water, and are a source of decay, I have, myself, adopted something like pyramidal training, though I have not yet gone far enough to report results. I think that so far as we can get, by early training rather than by severe cutting, one upright main stem with well distributed horizontal branches upon it, we shall achieve the best condition of health and longevity, and, if we do not permit the laterals to grow too thickly, of fruitfulness.

Whatever be our style of tree, we should carefully guard against severe pruning in ordinary cases. Pruning in any sense is a necessary evil, and presuppposes bad management or bad success with the plant to be pruned. But, as hardly any of us give due attention to early training, pinching and the like, we prune our trees for the same reason we whip our children—because we have neglected or mismanaged them in the nursery.

The season of pruning is also a disputed point. Practically, the winter is the most convenient time, because the period of greatest leisure to the orchardist. Lindley, speaking for England, says the time of pruning is usually winter or midsummer. Kenrick would do heavy pruning between the coming out of frost in spring and the opening of the leaf; moderate pruning in June or July. This was in Massachusetts. Downing says that practically "a fortnight before midsummer is by far the best season, on the whole, for pruning in the northern or southern States." Cab gives preference to June, July, and August, for moderate pruning, and considers the spring as the worst season. Barry says that in western New York they prune apples

and other hardy fruit as soon as the severe frosts are over, at the end of February and beginning of March. Thus do the doctor's disagree, and common folk, I think, may consequently prune in winter as the most convenient season.

Fruiting an orchard may doubtless be hastened by root pruning, but this is not often practiced with the apple. Summer pinching, or shortening in, has the same tendency. But with the apple these processes seem of less practical utility than here, to preserve the health and quantity of product. In the first place, all orchards have their "bearing year," in which they bear more abundantly than in the alternate years. This subject, and how to make trees bear every year, being under discussion in the American institute farmers' club in 1862, Prof. Mapes said: "If part of the fruit is stripped off before it exhausts the tree, it will give it strength enough to produce another [crop]." Mr. R. G. Pardee said: "Mr. Robert L. Pell pays more attention to the cultivation of his orchard than any other one I know, and has the greatest number of trees, but he does not get a full crop every year." "Mr. Carpenter thought he had succeeded by high manuring and good cultivation in making some of his trees bear good crops every year." John G. Bergen said, "in my opinion if a tree begins to bear full on an even year, say 1850, it will always bear even years; and even if it should not bear a crop for a half a dozen years, when it did, it would be upon the even year; and no tree that naturally bears full alternate years can be made to bear as full upon the odd years." Yet the Cultivator for 1848 says "that R. Manning, of Salem, with several hours' labor, cut off all the blossoms from a Baldwin apple tree in the spring of its bearing year. The consequence was, the bearing year was completely changed—the bearing years had become fruitful, and vice versa."

In the bearing year apples are apt to be too many in number, and too small in size, and some varieties seem to produce more fruit from the flowers of the same corymb than others, and thus grow their fruit in clusters. This suggests the thinning process pursued in the culture of the rarer and higher priced fruits. It is argued that thinning the fruit will not diminish the quantity of fruit, while it will greatly increase the size, color and flavor, of what remains; and that the cost of picking a given number of apples is not much greater if we pick half or more of them when small and green, and the other half when ripe; while the fruit suffered to remain on the trees will of course obtain a much higher price in the market, and prove far more satisfactory to the home palate. One fruit grower on the Mississippi, I am informed, has, by taking special care of this kind, made the Carolina red June a very profitable market fruit. It is claimed, also, that the seed-forming process being the exhaustive one, that a bushel of large apples will exhaust the vital powers of a tree less than a bushel of small ones. But as others regard the blossoming as the function that draws most from the vitality of the tree, we are placed in some doubt on this point.

Gathering apples for transportation or keeping, it is conceded on all hands, must be done with great care to injure neither fruit nor tree. It is a good rule to handle apples as if they were eggs, and to pick them as far as possible without getting into the tree, for fear of injury to the bark or small limbs. This is especially true of ealy summer apples, which are picked at a time when the bark is easily started. I have found long, light, strongly made ladders, in the shape of an acute inverted V, without support except what they get by leaning against the spray, or putting the apex in the fork of a limb, more satisfactory, on the whole, than any other ladder or stand for picking. Half bushel splint baskets with a hook attached to hang them on a round of the ladder, or on a convenient limb, are as large as most persons can handle to advantage, and will generally contain all the apples that can be picked without moving.

Apples when picked, if of early sorts, had better be put into place immediately. If going to market, they had better be boxed or barreled immediately. In warm weather they should have good ventilation, as close air and warmth induce rotting. In cold weather they are better close barreled. Winter apples some prefer to put in heaps or bins to undergo the supposed process of sweating, but my own opinion is, that dry, cool apples from the tree are fit for immediate barreling.

In keeping apples, attention must be paid, 1. To temperature: it should be low, not much above freezing, if possible, and even. 2. To humidity: apples should be neither in a dry nor a damp atmosphere; they should neither shrivel nor mold. 3. To light: should be excluded.

Barreling apples is the best common method of dealing with them. This excludes light and makes the changes less sudden, and if the barrels are kept in a cool shed, and put in a good cool cellar when the weather gets too cold for safety outside, the apple ought to keep tolerably well. The Nye "fruit preserving house" will do the thing better, only because it can make the cool, equable, and moderately dry atmosphere more constant, certain and enduring.

European apples, judging from the accounts, keep better than American ones. They seem to keep all the year, even in the southern part of Europe, without much difficulty. In America, northern apples keep better than southern varieties, and the same variety will keep long in the north and be worthless south. All these facts seem to mean only that an unripe apple will keep better than one fully matured. The apples of Europe that keep so long are very tough and flavorless, and the Rhode Island greening, of New England, that keeps so far into winter, is green and indigestible compared with the rich flavor and crisp flesh that the same variety has at Hermann.

Russet apples shrivel more than smooth skinned apples when exposed to the light and air, and must therefore be more carefully kept. The Pryor's red and the Gilpin are quite a contrast in this respect.

Apple products are numerous and valuable enough to be worthy of a consideration. First among these comes cider, an account of which I extract from the Chemistry of Common Life:

"Cider and perry are well known fermented drinks. The former, especially, is largely prepared and consumed in England, France and North America.

"The expressed juices of the apple and the pear contain grape sugar already formed. When left to themselves they soon begin to ferment without the action of the yeast, and during this fermentation the sugar is converted into alcohol, in the way already described.

"Cider differs in flavor, in acidity, in strength, and consequently in quality, with many circumstances. The kinds of apples which are grown and used for the purpose, the degree of ripeness they are allowed to attain before they are gathered, the time given them to mellow or ferment before they are crushed, the skill with which the several varieties are mixed before they are put into the mill, the nature of the climate, the character of the season, the quality of the soil, the mode in which the trees are managed—all these circumstances materially affect the quality of the expressed juice as it flows from the crushing mill; and then the after treatment of the juice may introduce a hundred new shades of difference among the several ripe ciders produced from the same juice.

"In Normandy not less than 5,000 differently named varieties of the acid or bitter apple are known and grown for the manufacture of cider. Some of the varieties are distinguished by as many as eighteen different names in different parts of the country. In that province, also, it is remarked that the cider produced upon chalk soils, from the same varieties of apple, differs in flavor from that of sandy districts, and both from that of clay soils; so that the flavor of the soil (gout de terrain) is in Normandy a familiar expression in reference to the qualities of this fermented drink.

"Amid these differences in quality, however, there are certain chemical characters in which all ciderers agree. They contain little extractive or solid nutritious matter. No bitter or narcotic ingredient has been added to them. They contain on an average about nine per cent. of alcohol; thus resembling in strength the common hock, the weaker champagnes and our stronger ales."

Cider, though not so old as wine, is a very ancient and respectable drink, being mentioned early in English history, and well known and received in the traditions of that people. It is, or rather was, a popular drink with Americans; and Coxe, our first writer on pomology, spends a good deal of time over cider making. In fact, he seemed to have more practical knowledge of the subject than any of his successors. But the temperance reform has banished the cider and many of the apple trees from their ancient haunts, and malt liquors have to some extent been substituted where there is no prejudice against cider drinking. Aside from its abuse as a drink, however, cider is a

useful article of diet in its boiled state, as a part of various apple compounds, and as vinegar. It furnishes an economical method of disposing of poor apples, and no large orchard should be without its cider mill and press.

Cider should be made from late fall or winter apples, as these contain the richest juice. Howe's Virginia crab, Campfield, Harrison, Gilpin and winesap are named as varieties of special value for the purpose. A mill that crushes the apple thoroughly is preferable to one that slices or grates. It should be run by a circular horse-power: a hand mill is too much for human flesh, or endless chain for horse flesh. The pomace should stand several hours (twelve hours, if possible) before pressing. A screw press is generally preferred, but I think a combination of the screw and lever press would be better than either. This could be arranged so as to secure the constant pressure of the one and the mechanical power of the other. In the plates of the London Cyclopædia there is a representation of a press of the kind, but I have never heard of its being introduced into this country.

The "cheese" is laid up with straw in hair sacks or in coffee sacks, and in a stout frame made with apertures to let out the juice. I am not certain which of these methods is best. The best cider, according to Coxe, is the middle of the pressing, but I have generally considered the last part as preferable.

Cider, after being pressed, should be strained as clean as possible, put into clean casks, in a cool place, with the bungs out, and the casks kept full until fermentation ceases. A syphon in the bung hole to prevent actual contact of the air with the cider is better than direct exposure. Then comes racking off the various nostrums to arrest further fermentation, etc., but these I must here pass over, stopping only to commend the following poem to conservative cider boys of the old time:

THE CIDER MILL.

Under the blue New England skies,
Flooded with sunshine a valley lies;

The mountains clasp it warm and sweet,
Like a sunny child to their rocky feet.

Three pearly lakes and a hundred streams
Lie on its quiet heart of dreams;

Its meadows are greenest ever seen,
Its harvest fields have the brightest sheen.

Through its trees the softest sunlight shakes,
And the whitest lillies gem its lakes.

I love, oh! better than words can tell,
Its every rock and grove and dell;

But most I love the gorge where the rill
Comes down by the old brown cider mill.

Above, the clear springs gurgle out,
And the upper meadows wind about;

Then join, and under willows flow
Round knolls where blue-beach whipstocks grow,

To rest in a shaded pool that keeps
The oak trees clasped in its crystal deeps.

Sheer twenty feet the water falls
Down from the old dam's broken walls,

Spatters the knobby boulders gray,
And laughing hies in the shade away,

Under great rocks, through trout-pools still,
With many a tumble down to the mill.

All the way down the nut-trees grow,
And squirrels hide above and below.

Acorns, beachnuts, chesnuts there
Drop all the fall through the hazy air,

And burs roll down with curled-up leaves
In the mellow light of harvest eves.

Forever, then, the still, old trees
Drink a wine of peace that has no lees.

By the roadside stands the cider mill.
Where a lowland slumber waits the rill,

A great brown building, two stories high,
On the western hill-face warm and dry;

And odorous piles of apples there
Fill with incense the golden air;

And heaps of pomace, mixed with straw,
To their amber sweets the late flies draw.

The carts back up to the upper door,
And spill their treasures in on the floor.

Down through the toothed-wheels they go
To the wide, deep cider press bel ow;

And the screws are turned by slow degrees
Down on the straw-laid cider cheese;

And with each turn a fuller stream
Bursts from beneath the groaning beam—

An amber stream the gods might sip,
And fear no morrow's parched lip.

But wherefore gods? Those ideal toys
Were soulless to real New England boys.

What classic goblet ever felt
Such thrilling touches through it melt

As throb electric along a straw
When boyish lips the cider draw?

The years are heavy with weary sounds,
And their discord life's sweet music drowns.

But yet I hear, oh! sweet, oh! sweet,
The rill that bathed my bare brown feet.

And yet the cider drips and falls
On my inward ear at intervals;

And I lead at times in a sad, sweet dream
To the babbling of that little stream;

And I sit in a visioned autumn still,
In the sunny door of the cider mill.

Dried apples are an important article of diet, and enter considerably into commerce, though not regarded, generally, by apple growers as a very profitable product. In regions remote from transportation, however, by the use of "dry houses," dried apples may, perhaps, be cured to advantage. Their comparative value is diminished somewhat by better modes of keeping the apple and other fruits. Canning alone has furnished an easy and cheap method of preserving the perishable fruits in large quantities. A greater distribution and better understanding of the long-keeping varieties of the apple make green apples all the year round. Fruit-preserving houses will increase the quantity of long-keeping fruit, until, in many places, there will be little need of the dried fruit. For army, naval and like purposes they will, however, probably maintain their position.

According to Loudon, "dried apples (beaufins) are prepared in great numbers in Norfolk by drying them slowly in bakers' ovens after the bread is drawn, and occasionally taking them out and pressing them with the hand to flatten them, till they are perfectly soft and of a rich, deep brown, when they are considered fit for the London market."

The culinary products of the apple are almost too numerous to enumerate. Raisine compasi, according to Loudon, is a very common preparation in Europe. "This is a very favorite sweetmeat with the Parisians, and it is made by boiling any given quantity of must or new wine, till it is diminished one-half, skimming it continually as fresh scum arises, and afterward straining the liquor; then take apples pared and cut into quarters, and putting them into the raisini, let it simmer gently, stirring it continually with a long wooden spoon till the apples become thoroughly amalgamated with the liquor, and the whole forms a species of marmalade, which is extremely agreeable to the taste. When prepared in the northern provinces, the raisini, after the first boiling, skimming and straining, should be set for twenty-four hours in a cool place, when a saline liquor like a scum will appear on the surface; this must be removed and the liquor strained before it is mixed with apples, as before. This scum is the tartaric acid, which would spoil the raisini and prevent it from keeping, but which is not perceivable when the grapes have ripened in a southern climate. The raisini, when properly prepared, is sweet, but with a slight flavor of acidity, like lemon mixed with honey. The best raisini is that of Burgundy. In Normandy a similar marmalade is composed of cider and pears; but it is not so good as the other kind, being apt to ferment. In some cases the pears are put into an earthen vessel, without water, and placed in a baker's oven after the bread has been drawn, previous to mixing with the cider. The best raisini is considered very wholesome, particularly for children, who eat it spread on bread, and for persons in delicate health, whose stomachs will not bear butter, and is in France what marmalade is in Britain, and, more especially, in Scotland. Raisini is abundant and

cheap in Paris, where, however, a composition is often substituted for it, made of honey and water instead of wine; an imposition which may be detected by putting the raisini in water, with which it will not unite, if pure. In Italy the raisini is eaten with preparations, either of Indian corn or of macaroni to give a flavor to these dishes. The apple sauce of New England, and still more the apple butter of Pennsylvania and the west, is much the same with the above preparations.

To make good apple butter, says a correspondent of the American institute farmers' club, "take of sweet cider, fresh from the press, and boil two gallons [I should prefer three] into one, pare, core and cut into quarters sweet apples, free from blemish. It will improve the flavor to add a few pears or quinces, if convenient. The cider sirup being skimmed, and boiling hot, the fruit is added gradually, and must be stirred constantly until sufficiently cooked, when the whole will be homogeneous and of a fine chocolate color. Constant attention is required to prevent burning. When well made it is entirely free from lumps, and about as thick as good mush."

The writer does not state a fact, that the easiest way of doing the constant stirring requisite is to use a right-angled "stirrer," made by putting a handle, three or four feet long, into one end of a bit of planed board perforated with a number of three-quarter or inch holes at its lower extremity.

Apples are an important component in many dishes and artistic compounds that a mere man cannot be expected to understand or appreciate, save in the eating. I must refer to the numerous cookbooks for further facts concerning apple dumplings, pies, puffs, custards, puddings, fritters, preserves, marmalades, jelly, float, snow cake, tea and bread, to say nothing of the simpler article apples, boiled, stewed, baked, roasted, coddled, steamed and fried.

But I must delay a moment to give Henry Ward Beecher's opinion of perfect apple pie. "It is a glorious unity in which sugar gives up its nature as sugar, and butter ceases to be butter, and each flavorsome spice gladly evanishes from its own full nature, that all of them by a common death may rise into the new life of apple pie; not that apple is longer apple. It, too, is transformed, and the final pie, though born of apple, sugar, butter, nutmeg, cinnamon and lemon, is like none of these, but the compound ideal of them all, refined, purified, and by fire fixed in blissful perfection."

And I must add from Punch's Cook a receipt in which useful knowledge is harmonized to the pleasures of poetry and music.

"APPLE PIE."

AIR—*"All that's bright must fade."*

All new dishes fade—
The newest oft the fleetest,
Of all the pies now made,
The apple's still the sweetest;

Cut and come again,
The sirup upward springing;
While my life and taste remain,
To thee my heart is clinging.
Other dainties fade—
The newest oft the fleetest;
But of all the pies now made,
The apple's still the sweetest.

Who a pie would make,
First his apples slices;
Then he ought to take
Some cloves—the best of spices;
Grate some lemon rind,
Butter add discreetly;
Then some sugar mix—but mind
The pie's not made too sweetly.
Every pie that's made
With sugar is completest;
But moderation should pervade—
Too sweet is not the sweetest.

Who would tone impart,
Must, if my word is trusted
Add to his pie, or tart
A glass of port—old crusted;
If a man of taste,
He, complete to make it,
In the very finest paste
Will enclose and bake it.
Pies have each their grade;
But, when this thou eatest,
Of all that e'er were made,
You'll say 'tis best and sweetest.

THURSDAY MORNING.

The meeting was opened with prayer by the Rev. J. J. Colman. Mr. J. H. Tice read the following essay:

WHY EVERGREENS SHOULD BE PLANTED.

Man, in the planting of trees, is induced to do so either from æsthetic or utilitarian considerations. Evergreens, to the man of taste, have their value; because, in embodying his idea of the beautiful, there is a vacuum that nothing will fill excepting the evergreen. Beautiful in June, the gayest month of flowers, they are elegant, graceful and no less beautiful in the dreariest month of winter. There is no shrub or tree so completely under the control of artistic taste, or by training, pruning and disposition so susceptible of being made effective and striking, as the evergreen. Then, in the dreary months

of winter, when nature seems smitten with universal death, there is the evergreen, recalling the memory of green fields and leafy bowers that withered and faded under the rude touch of autumnal frosts. Whether sporting in the brief sunshine, or swaying to and fro in the winter blast, or laden down with the new fallen snow, it is always an object of beauty and cheerfulness, inspiring man to thought and contemplation. In regions where they are indigenous, and where they constitute a large portion of the timber, they not only relieve the dreariness of the forest, but the winter winds playing through their tops make a music sweeter than Æolian harps. We plant them in our cemeteries to indicate that we will keep the memory of the loved departed ever green in our hearts. Unfortunately, this use of them in a country where they are mostly seen in cemeteries, has associated them with the gloom of the grave, and has operated largely to expel them from our gardens, yards and lawns. But the denizen of an evergreen region knows that in the gloomy and cheerless months of winter the protecting boughs of the evergreen are the favorite haunts of the rabbit, quail and grouse. With him they call up the associations of life, and not of death, and, therefore, in the cemetry they are to him suggestive of omnipresent life and immortality.

The man of taste, however, needs no lecture to induce him to plant them liberally. It is the utilitarian that needs lecturing to convince him that they are useful, and that they will minister to his comfort and happiness, and to that of his dumb beasts. Not only so, but by making his animals comfortable during the winter's cold, if it does not diminish the quantity of their food, it at least brings them through in an improved condition. If this is so, then evergreens have a money value, which the utilitarian cannot overlook.

Plant a few evergreens so that they will make a shelter, and see how quick the poultry will make the discovery; and whether in winter storm or sunshine the hens will be found nestled comfortably under their protecting branches. If you have a half hardy rose, shrub, or plant, place around it a few branches of evergreens, and it passes through the rigors of winter safely. If you plant them north and west, or anywhere whence the coldest winds of winter come, your house or barn will be the warmer for it, diminishing fuel in the one and food in the other. Wherever pines form a large part of the trees of the forest, there the climate is modified and the rigors of winter not so severely felt as in the same latitude where pines are absent. Everybody knows that an ordinary forest produces a modification of the climate, as compared with the open prairie. Congress last winter had a measure under consideration of donating large quantities of land to companies or individuals who would plant belts of timber, mostly of evergreens, westward over the plains to the Rocky mountains, for the purpose of arresting the cold winds sweeping over that treeless region and modifying the climate. The intense cold storms, like that of December, 1863, which swept over the Mississippi valley with such fatal effect,

never reach the Atlantic slope, being arrested by the mountains of the Appalachian chain. If these mountains were treeless, or if their forests were any other than evergreens, this complete arrestation would not take place, but in a degree the effects of these storms would be felt over the whole continent. The storm of 1863 passed south, and was felt in all its rigor in Tennessee, Mississippi and north Alabama, where the sentinels froze at their posts, yet it reached not the valleys of the Susquehanna, Potomac and Shenandoah. The facts, then, are that large belts of pine, interposed between an Arctic storm and a region not differing in latitude, or materially in any respects from that desolated by the storm, will break it, and effectually protect the region beyond. On a small scale the same effects are experienced by a screen of evergreens planted to protect a house, barn, walk or drive. What is the cause of this? The common solution is, that the wind being arrested, the cold is not driven through our clothing, and consequently is not so sensible. But this is not a sufficient reason. How is it that the thermometer will indicate several degrees colder on the wind side than on the protected side of evergreens? Does the wind penetrate the glass and effect the mercury in a storm? If not, then some other explanation is necessary.

A slight rubbing sets a friction match on fire; rubbing the hands warms them; the beating of iron heats it; the hammer of a gunlock strikes and explodes the percussion cap; piles are often set on fire by the steamhammer driving them; the friction of machinery and of the carbrake often set them on fire. Those who are old enough to remember the tinderbox, used for striking fire prior to the invention of matches, or the old flintlock prior to the invention of percussion caps, know that the collision of flint and steel produces sparks, which were then utilized in the one case for making fire, in the other to explode gunpowder. All these phenomena, and many others that could be named, are explained by one and the same cause: that cause is the arrest of motion.

Wherever we cast our eyes we are made aware of the omnipresent fact that everywhere forces are in operation. Forces also seem to expend themselves, and apparently ending in nothing; but close scrutiny and scientific investigation reveal that effects have been produced, and that the apparently expended force has indeed ceased to exist in its original form, but in its effects reappeared in some other. Instead of being annihilated, it has merely undergone a metamorphosis and reappeared in an equivalent amount of some other force or forces. Writers on the corelation and equivalence of force have clearly demonstrated this to be a fact. Grove, Helmholtz, Meyer, and others, might be cited as authority on this point.

It would be irrelevant to speak here of force in general, when force in the form of motion only is pertinent to our theme. The question of the origin of motion does not concern us. It is enough for us to state, wherever we can trace it to its genisis, we always find it to

pre-exist in some other mode of force. If we trace it to its sequence, heat, electricity, light and magnetism are found to be the modes of force in which it dissipated or disappears. These latter, again, may reappear in the form of motion, and so on in an endless circle. Heat, however, is an invariable mode of force in which motion disappears; and is the one that concerns our present discussion. The heating of iron by hammering, the evolution of heat by friction, and the setting on fire of wood by placing it under the powerful blows of a steam-hammer, are instances in which heat arises as motion ceases. It is also uniformly found that the heat evolved is great in proportion that the motion lost is great. The motion accompanying chemical combinations invariably produces heat, and when the affinities are intense, light also. Faraday discovered that a change of magnetic state is accompanied by heat, and that the magnetization of a body altered its internal structure. Molecular motion must, therefore, take place, and its presence is indicated by heat. In fact, physicists now regard heat as nothing else but molecular motion. Therefore, to say that the arrest of motion produces heat, is merely to say that as one form of motion is lost another form appears. Mr. Joule, by experiments, ascertained that the fall of seven hundred and seventy-two pounds through one foot of space will raise the temperature of one pound of water one degree of Fahrenheit. Professor Helmholtz, in his Interaction of Natural Forces, calculates the thermal equivalent of the earth's motion through space from the now received datum of Joule. "If our earth," says he, "were by a sudden shock brought to rest in her orbit by such a shock, a quantity of heat would be generated equal to that produced by the combustion of fourteen such earths of solid coal; making the most unfavorable assumption as to its capacity for heat—that is, placing it equal to that of water—the mass of the earth would thereby be heated eleven thousand two hundred degrees: it would, therefore, be quite fused, and for the most part reduced to vapor. If, then, the earth, having been thus brought to rest, should fall into the sun, which of course would be the case, the quantity of heat developed by the shock would be four times greater." This great heat would reduce the earth to gases of extreme rarity. And if the same catastrophe would simultaneously happen to all the planets in the solar system, they and the sun itself would be reduced to gases of such extreme rarity as to fill all the space within and beyond the orbit of the remotest planet, a condition assumed to have been the case in the nebular hypothesis of La Place, prior to the existence of the present solar system.

The evolution of heat is the invariable accompaniment of the arrest of motion, which is true, whether predicated of the slow motion of muscular extension and contraction, or of the almost inconceivable swift motion of the earth—of a million and a half miles per day in its orbit. If it is true of these, it must also be true of the arrest of motion of storms or ordinary currents of air.

We frequently see accounts in the newspapers of tornadoes, and often the singular fact is noted that the few green leaves left where the tornadoes expended their greatest violence appear as if blasted by the heat of a furnace. I had twice an opportunity of observing this fact—once in Alabama, a few days after the hurricane had passed, and again in Iowa, in less than half an hour afterward. In both cases, the leaves and parts of leaves left appeared as if dried by the heat of a fire. True, this effect may, partly, have been owing to electricity likewise evolved by the arrest of motion; but as heat always accompanies electricity, in either case it proves our postulate. It is, then, an indisputable fact that whatever modification of the climate of the Mississippi valley, especially that of the treeless plains, between the Missouri and the Rocky mountains, can be made by man, must be effected by planting trees to arrest the gelid storms that sweep over them with such merciless fury. And since they will be more effectually arrested by evergreens than any other variety of trees, they ought to constitute a large part, and be so planted as to form continuous wind-breaks the entire way. Moreover, if we want to operate on a smaller scale, and wish to protect our dwellings from the piercing, penetrating winds that rage with such fierceness on the prairies and howl so dismally around our exposed dwellings, we must plant evergreens to break their force; and in breaking their force an amount of heat is evolved equivalent to their momentum, and moderating to that degree the temperature of the air in the immediate vicinity.

Before closing, it will be pertinent to the purpose to give a list of the best evergreens for planting, proved to be hardy in this climate. If the planting is for wind-breaks only, our native pines should be used, which can very readily be raised from the seed. But whether for use or ornament the greater part ought to be natives, because they are healthier and hardier than foreign varieties generally, and as for beauty, they are seldom equaled and never surpassed. They have also the merit of retaining their freshness unimpaired during the winter.

First, then, we will name the pine, or as it is scientifically called, pinus, from the Latin.

First among these is pinus strobus, the white pine, Weymouth pine or New England pine, as it is variously called. It is a vigorous grower, and easily transplanted. For a wind-break in an open or prairie country, it has no equal, and a nobler or statelier tree cannot be found.

Pinus Resinosa—Resinous pine, or red pine, in New England sometimes called Norway pine.

P. Mitis—The yellow pine of the North.

P. Tæda—Loblolly or old field pine, leaves rigid, from six to ten inches long, light green.

P. Palustris—Marsh, long leaved pine, and yellow pine of the

south. Leaves fasciculate in threes, and from nine to fifteen inches long. Most of the turpentine of commerce is obtained from this variety.

The remaining natives, as p. banksiana, (scrub pines), p. inops (Jersey scrub pine), and p. rigida (pitch pine) have but little merit.

There is, however, one, a native of the mountains of Oregon—p. ponderosa—the most rapid grower of all pines, of long leaves, wide spreading branches and unchangeable color. It bids fair to become a general favorite.

Of the foreign that have been tried with satisfactory results are p. Austriaca (Austrian pine) and p. Sylvestri (Scotch pine); both have rigid leaves, and retain their color fresh throughout the year, and are indispensable in landscape gardening.

The Juniperus Virginiana (red cedar), though of slow growth, is ornamental when well grown, but it browns badly in winter.

The Juniperus Communis—The common juniper is a common shrub in Pennsylvania and to the north, abounding especially in New Jersey. Its prostrate habit, dense growth and capacity to bear shearing makes it very desirable.

The Albies, or Spruce—First of these is a. canadensis, hemlock spruce, or hemlock, one of the most beautiful of evergreens; a. alba, white spruce; a. nigra, black spruce, and a. rubra, red spruce—are all natives, and are more or less fancied by cultivators. A. balsamea, balsam spruce or fir, is considerably planted. It is a quick grower, and handsome, when young, but rugged and unsightly when old. It is generally regarded as short-lived.

Of the foreign species, a. excelsa, the lofty abies, Norway spruce or fir, is unrivaled; easily transplanted, quick of growth, beautiful when young, and improving with age. It is invaluable either for screens or hedges, and indispensable for ornament. Experience has shown that it flourishes equally as well, if not better, than our native species.

A. Fraseri—Fraser's spruce or double balsam fir, is a native of the mountains of Pennsylvania and southward, and but sparsely in the New England states. A highly ornamental species.

Thuja, or Arbor Vitæ—There is but one species of thuja, the t. occidentalis, western thuja or American arbor vitæ, that is a native of the American continent. It abounds in the lake region of the United States and Canada. It is much cultivated for ornament, but browns badly in winter. It is in every respect inferior to the thuja orientalis, eastern thuja, or Chinese arbor vitæ.

Cupressus Cypress—There is but one species of the genus cupressus that is an evergreen, native of America: that is the c. thyoides thuja—like cupressus or white cedar. It abounds in swamps and pine forests, from New England south to the gulf.

Taxus yew has but one representative in the western continent, the t. canadensis, American yew or ground hemlock. It is found from

Canada south to North Carolina, and west to Kentucky and Tennessee. It requires to be shaded. The foreign yews have not proved hardy in our western climate.

The ilex holly comprises two species of evergreens, ilex opaca (the American holly) and i. glabra, by some botanist called prinos glaber. This latter is the ink berry or evergreen prinos found along the Atlantic coast, and much prized by florists as one of the best evergreens to work in bouquets.

Other evergreens might be mentioned—among others the berberis, barberry and mahonias; the latter natives of the Rocky mountains and Sierra Nevada, and have proved hardy as far as tried. Nearly, if not quite all, of the foregoing evergreens, and many others, can be seen in Mr. Henry Shaw's botanical garden, or in his arboretum, near St. Louis. Those desirous of planting cannot spend a few hours more pleasantly and profitably than by paying a visit to the grounds of this liberal, enterprising and munificently generous patron of botany and landscape gardening.

Mr. Husmann: Had found all the pines, especially p. strobers, difficult to transplant. That was also the experience of his customers.

Dr. Long: I would recommend the red cedar, a tree the essayist does not recommend. It may be slow as compared with some others, but I think it a good grower. They can be got easily, and transplanted at almost any time of the year. I pick them from the bluffs at three inches and upward, and plant them out in my garden, and they grow well. In regard to the white pine, it is too open a grower to make a good wind-break, or you must have quite a considerable belt of them. Where I was brought up it was common, and found to be hard to transplant. I have taken up the cedar at four feet high. It has a tendency to turn brown, but still there are exceptions to this; and by trimming you can train it in any way. In regard to the effect of the screen, I ascribe the result of the screen to the interruption of the air. The India rubber coat keeps out the air and retains the heat; it is so with a screen or board fence. Put the finger in hot water and keep it in motion, and it will feel cool; let it remain still and it will feel too hot.

Rev. C. Peabody: Mr. Tice deserves the thanks of the society for his essay. In reference to the evergreen breaking the wind and thereby increasing the temperature by "the arrest of motion," he would say it was by friction. In pile driving, etc., there is something more than mere arrest of motion, and this he called friction. The trip hammer diminishes bulk, and produces heat. It may resolve itself into this, that friction always evolves heat. The true explanation is not so much the arresting the motion of the wind by the wind-break; as, by the friction produced by the innumerable leaflets, the temperature of the air will be considerably raised. In those regions of country that are so very cold we have another beautiful manifestation of the wisdom of the Creator. There He has arranged these trees in

their greatest perfection, and those innumerable leaflets, all evolving heat by the vast amount of friction. This renders those dreary regions a habitation fit for man. Perhaps Mr. Tice can, however, show these two things, the arrest of motion and friction, to be but one. It is true, the India rubber coat will keep out the wind better than the beaver coat, but in this case the temperature is not affected by the wind, but by the heat of the body. The old men in New Hampshire and Vermont complain that the winters are growing colder. One reason for this is that they have cut down the evergreen trees for lumber and sent them away, thus removing this fine natural protection against the severity of the climate. He was glad to hear the idea of planting trees upon those vast plains thus brought out. It would lead to the filling up of those vast tracts of as yet uninhabitable land.

Prof. Swallow: The principle is this: where there is condensation heat is evolved. Where the bulk increases the temperature falls. Where we put salt to ice, water is formed, the bulk is diminished and the cold increased. So in pile driving, flint and steel. All these examples are condensation. We have made progress, but for our purposes we don't need to know the ultimate end. We want a rule by which to know when heat is evolved, and I have given the universal one.

Mr. Peabody: A question: Is heat never communicated but by this change of bulk? We know that when two bodies of unequal temperature are brought into juxtaposition that the heat is communicated from the one to the other, till an equilibrum is produced. If one is at 30° and the other 40°, they will both be brought to the average of 35°.

Prof. Swallow: In the case of increase of temperature by evergreens, we find the universal principle in nature is "that the vital force increases the temperature, and that always in proportion as the vital force is active. It is the vital principle within us that maintains and increases the temperature in our bodies. This may be resolved into the chemical action going on in the lungs in the process of breathing. Any man here could throw off his coat and stand in the street in the coldest day, and, by breathing, put himself into a perspiration. Continue to breathe rapidly and you will soon be in a perspiration.

Rev. Peabody: The action of this vital principle is too much overlooked by us. It is a universal principle in nature, and this fact of the increase of temperature by rapid breathing ought to be impressed on every one, at all times, so that in case of exposure to extreme cold, rapid breathing alone will increase and maintain the temperature.

Prof. Swallow: As a scientific man I have long since known that it is useless to dispute about mere technicalities. Science is merely the arrangement of the facts of nature. We don't need to know the final cause of heat, as it regards chemical or vital action; but as to the planting of trees and the increase of temperature by so doing,

wherever there is life there is increase in temperature in proportion to the increase in the vital action. The evergreen has its vitality in activity in winter, although not so much so as in summer. I have proved this in the forests in Maine, by boring a hole in two trees, a pine and maple, placing a thermometer in the hole and closing it up from all external influences, and examining the results from time to time. I have the tables of these observations now at home. The pine had always a higher temperature than the maple. This is one reason why evergreens are preferable for shelter to deciduous trees. Of our native trees the white pine would be best, if it was not too thin in its branches; in this respect not so good as the cedar. About the cypress, it does not grow much further north than Cape Girardeau. The balsam fir has grown three feet with me each year—it is dense, and the vital principle very active in winter. Black spruce has dense foliage, grows well here. For planting on the plains or almost anywhere, there is a pine found on Smoky branch that is excelled by none for its valuable qualities as a wind-break in those extensive regions in the vicinity of the Rocky mountains. (Query—Is the pinus ponderosa.—*Secretary.*)

Mr. Husmann: Knows that evergreens are a great protection. I think that the reflections of the sun's rays may aid in part in raising the temperature; but the reasons are really immaterial—the facts are what we want. The red cedar can be made dense by shearing. As to its slow growth, I have not seen it. I think it the best of our native evergreens. Norway spruce is very good, dense—stands clipping well.

Mr. C. Sanders: I think that the best we have is of the rejected pine family. The Scotch pine is easy raised, rapid grower, thick and fine. Of the "pines," the Scotch pine is the densest. Its vital principle must be strong, as it is warmer than any other. All the "abies" are slow growers when young. These trees could be got last year by mail from Mr. Meehan, of the Gardener's Monthly, at $4 per hundred. They are small, and, planted out two or three years in rows, require but little care, excepting some shade, and become our most valuable trees. Would plant from ten to twenty feet; if in double rows, about twelve feet. Another point: in our dampish soils they are invaluable, doing well when hardly any other will do. There is no oak hardier. Grows well here, and as far north as Chicago. Would like to hear how they do further west than this state.

Mr. Tice: I desire to say but a few words to set me right in regard to the position assumed in the essay. The difference between me and the gentlemen is that they stop at a proximate cause, while I go to—I will not say an ultimate cause, because no finite mind is capable of that—but to a remoter cause, and certainly to the most ulterior cause yet grasped by science.

My proposition is that the arrest of motion generates heat. Dr. Peabody says it is not the arrest of motion, but friction, that produces

heat, as in the instance of setting on fire the carbrake. I ask what is friction? Is it not resistance to motion? If the brake is applied, it will arrest the motion of the car, and bring it to a stand still, unless the force producing motion is persistent, and too great to be overcome by the resistance. Everybody knows that a rough body produces more friction than a smooth one, because it opposes more resistance, or, in other words, arrests more motion. Prof. Swallow says in chemical action, when condensation takes place, heat is evolved, but when expansion or increase of bulk takes place, cold is the result. This does not militate against my proposition.

It is evident that, whether condensation or expansion takes place, in either case there is molecular motion. The case of condensation is a proof of the law as stated.

That of expansion is only apparently an exception. Everybody knows that the expansion of a body increases its capacity to absorb heat.

Now, if the expansion increases the capacity of the body to absorb heat, so as to be greater than the quantity evolved by the molecular motion, cold is the result. That is, more heat is absorbed than is evolved. The fact stated by him, that the temperature of the evergreens is greater in winter than that of deciduous trees, is new to me. But as he assigns it to greater vital action, that merely proves my postulate. Vital action, of course, consists in motion, which is continually lost, but is sustained by the persistence of vital action. The law as stated is now received by all physicists as the great law of the universe, and all the heat radiated from the sun is now regarded as the result of the condensation of the body of the sun. But, as Prof. Swallow is a scientific man, he knows all this, and it is unnecessary.

Prof. Swallow and Dr. Spalding made some remarks upon the feelings against introducing scientific matters into such meetings, as if science was anything else than the orderly arrangement of the practical teachings of nature.

REPORT.

The committee on orchards beg leave to report that owing to causes over which they had no control, they were prevented from making that thorough investigation necessary to do justice to the subject intrusted to their charge.

The season was also one of the most unfavorable that has occurred for years for the products of the orchard, and the crop greatly short of an average one. The fruit that survived all the unfavorable influences of a cold, backward spring, midsummer drought, and an exceedingly wet September, was mostly very fair in appearance, good in quality, but extremely liable to early decay.

The orchards in spring put forth more than a usual amount of blossoms. But when the trees were in full bloom we were visited for several successive weeks with a continuous raw and cold wind, and in a

few localities with slight frosts. The effect of this long, damp, chilly weather was to cause the bloom to blight, and the young fruit to wither. Apples and pears, when the size of a sparrow's egg, turned black and dropped off, the dead fruit literally covering the ground. Cherries and peaches, when not winter-killed, followed suit, and resulted, as above stated, in a crop greatly below the annual average. Much of the fruit remaining on the trees was more than usually knotty, probably attributable to the same cause that produced the dropping. The crop being short and the summer favorable to the increase and multiplication of insects, a large portion of the remaining fruit was much injured by their depredations.

As far as our experience and observations extend, the following varieties have given the most satisfactory results:

APPLES.

Summer—Early harvest (earliest), sops of wine (most profitable), summer rose, red June, Keswick coddling, and early Pennock.

Fall—Maiden's blush, rambo, late strawberry, Pennsylvania red-streak, or wine.

Early winter—Rhode Island greening, Pennock or large romanite, Rome beauty, and Wagoner.

Winter—Winesap, Rawle's janet, red Canada, Gilpin or small romanite, white winter pearmain, Newtown pippin, and Pryor's red.

All of which is respectfully submitted.

JOHN H. TICE.

W. C. Flagg: I wish to ask about the canker worm in this vicinity. Its ravages in Michigan and some portions of Illinois are such as to excite fears about the entire ruin of the apple orchards. I had some in my orchard, and think that, without thinking about it, I took the best method of getting rid of them.

They drop from the trees and go into the ground in July, and remain there during fall, winter and early spring. By breaking the ground late in the fall, they are disturbed, and cannot again get down into the ground before frost overtakes them. Breaking up again in early spring will, without doubt, be of great service.

Dr. Long: When I was with my father he was much troubled with them. He let in his hogs, and they rooted up the orchard, and destroyed the larvæ; next year the trees bore well, while the other orchards were stripped of their leaves. Some years ago the orchards of some of my neighbors were much affected by the canker worm. They spread to my orchard, the trees of which were ten to twelve years set. I plowed late in the fall, just before freezing, and destroyed all the canker worms in the orchard. I have gotten them thus two or three times, and always get rid of them thus. They increase very fast. Plow very shallow, so that you can freeze them. They come up with the first warm weather.

Dr. Spalding: I wish to say a few words about membership. Having been much in Cincinnati this last year, I wondered at the success of the Cincinnati society. They have a membership of over 500 at three dollars each. That is the reason they can get along so well. They have something to work with. I think that by a little effort we can raise our membership to a thousand.

Mr. Riehl: I move that a committe be appointed to solicit names to increase our membership. Adopted.

Adjourned to visit the fruit preserving house.

AFTERNOON SESSION.

The business was opened by the reading, by Mr. Jordan, of an essay on the

USES AND ABUSES OF MANURES.

Mr. President, and members Missouri State Horticultural Society:

Twenty-seven years ago Justus Von Liebeg was requested to furnish to the British association an essay on the chemical processes in the nutrition of vegetables, and with his large amount of knowledge of that science, he was compelled to give them four hundred closely printed twelve-mo. pages; and as I have read and re-read his chemistry and natural laws of husbandry in connection with other eminent works, I almost shrink from the endeavor to furnish this association an essay on this important subject in so few lines. At best, I can only give a few facts and suggestions, and if I can inform one how he can make five spears of grass grow where only four grow now, I shall feel myself amply paid. Manure is any substance that will fertilize the soil and produce a healthy growth of plants. If we have a knowledge of the chemical conditions of the life of plants, we will be able to obtain a clearer view of theory and practice of agriculture.

Chemistry tells us that all plants contain combustible and incombustible constituents. The most essential elements in the ash of plants are phosphoric acid, sulphuric acid, potash, soda, lime, magnesia, iron, and chloride of sodium; the combustible constituents are carbonic acid, ammonia, sulphuric acid and water. By the vital process of vegetation plants are formed of these materials, which are the food of plants.

The gaseous elements form component parts of the atmosphere. That part of plants that passes off by decomposition by combustion in a gaseous form, was received from the atmosphere through the leaves. The solid or fixed elements are in the ground, and are absorbed by the roots. The roots also receive some of the gaseous elements. Nutrition is a process by which food is assimilated; a plant grows when it absorbs materials suited to become constituent elements of the plant. To enable a plant to attain its maximum of growth, the soil must at all times yield in an available form the whole quantity of

each of its constituents; and on the other hand, the cosmic condition —heat, moisture and sunlight—must co-operate to transmute the absorbed substances into the organs of the plants.

The same law holds good in the animal kingdom. We well know how animals will select their food; we do not feed the same materials to all animals. That man who would feed fresh beef to his lambs, and fresh clover to his dogs, would be thought foolish by most observers; yet many agriculturists are as unwise in their appication of manures. To make the comparison a parallel one, we would consider that man below zero in knowledge who would place before his horse twenty varieties of food, out of which the animal would select five and reject fifteen; yet such is the case with the most of us in our use of manure.

From the soil and air plants receive their food necessary for their development; hence an acquaintance with its chemical and physical properties is important in helping us to understand the nutritive processes of plants, and the operations of agriculture. As a matter of course, a soil to be fruitful for cultivated plants must, as a primary condition, contain in sufficient quantities the nutritive substances required by those plants. But chemical analysis, which determines this relation, gives but rarely a correct standard by which to measure the fertility of different soils; because the nutritive substances therein, to be really available and effective, must have a certain form and condition, which analysis reveals but imperfectly.

Godechen tells us, in his analysis of different plants, "that Padina pavonia, a sea-water plant, contains more than eight per cent. of manganese, but that sea water contained manganese in such exceedingly small quantities that it would certainly have escaped analysis were it not invariably found in marine plants." Therefore we see it will not do to trust an analysis of the soil, but it may assist, as it will also to analyze the plants we wish to grow, and apply such food as we find deficient in the soil, required by the plants.

The power of the soil to nourish cultivated plants is, therefore, in exact proportion to the quantity of nutritive substance which it contains in a state of physical saturation. A careful mixture and distribution of manures in the soil are the most important means of making it effectual; a bone, weighing one-half pound, in a cubic foot of soil has no perceptible influence, but reduce it to powder and mix well with the soil, and there will be a marked influence on vegetation. The true art of the practical farmer consists in rightly applying the manures in his field, to make them effective, and on that point I should be pleased to speak at length on the importance of deep plowing, trenching, pulverizing the soil and underdraining, but I hope these points will be fully brought out in the discussions that will follow the reading of this paper. We all well know the absorbing powers of charcoal, where dirty water is filtered through it; so the arable soil possesses the same properties. Diluted liquid manure, of deep color and strong smell, filtered through pulverized soil, flows off through

under drains colorless and inordorous. The particles of earth have the power of attracting the most important elements of food conveyed to them in watery solution, and giving it out to the roots of plants. Stagnant water in the ground is a great injury to the growth of plants, preventing the assimilation of their food. The fertilizing properties of manure require the agencies of air, heat and light to assist in their decomposition; hence the importance of underdraining.

We speak of our inexhaustible soil, and have learned to look upon manure as a useless article; but I tell you we are contracting a debt at a high rate of compound interest, and mortgaging our farms as security, and before long we will be called upon to pay up; then stay-laws and exemptions will not be known. The early farmers of the Connecticut valley used to cart their manure into the river, as they supposed it was useless and would prevent the spread of weeds; but the farmers of that valley, to-day, go to the river in search of manure, and every year large quantities of fish are caught and applied to their fields for their fertilizing properties. The farmers of the Mississippi valley are doing nearly as bad. I have seen piles of manure accumulate around barns to that extent that the barn would be removed to get the manure out of the way, others have burned it; and another class have allowed the rain to carry it into the river, and still a large class have not only let the manure go to waste, but have removed crop after crop from their farms without returning one cent's worth of manure. This I call spending interest and principal, and sooner or later we will be compelled to examine the balance sheet.

In selecting manures, we should choose those of the greatest value and least expense. The earthy phosphates are among the most important for the productiveness of land, because our system of selling our grain, hay and meat, tend to remove them from the soil. Among the neutral-phosphates, bone-dust holds the first rank. When bones are exposed to a high pressure of steam, they lose their toughness, and can be ground to a powder, and can be easily spread on the ground.

One of the worthy members of this association, who applied the bones as he received them from the slaughter-house in this city, after being steamed, informs me that one load of bones was worth more than four loads of any other manure for his meadows.

Superphosphate of lime is made of bones dissolved with sulphuric acid. The use of this manure created a wonderful sensation a few years ago around New York, and those that used it gave it great credit; but on the third or fourth application it seemed to have lost its power, and did not meet their expectations. Had those that used it known the laws of vegetation they would have seen that other fertilizers were necessary to prevent exhaustion. Potash is much wanted in our soils. I am informed by one of our strawberry growers that a dressing of wood ashes produced a decided improvement in his strawberry crop; and I know by experience that wood ashes are highly valuable around trees and vines.

The eighth census of the United States, on agriculture, furnishes us an account of a series of experiments by Mr. Lawes. He says: "Ammonia or nitrogen exists in all soils, but usually in a condition unavailable to plants, except in small quantities." It is rendered active and available by tillage; hence, the advantage of summer fallowing on clay soils.

"Such soils frequently abound in nitrogen and other elements of plants, but they are in an insoluble condition. The soil is so compact that light, heat and air, the three grand agents of decomposition, are exhausted, and it is only by tillage, by deeply stirring the soil, by exposing it to the sun and letting in the air, that these inert substances can be rendered available as food for plants. Ammonia and nitric acid exist in the atmosphere, in the dews and rain water."

Professor Way, chemist to the royal agricultural society of England, made a series of investigations, in which he found that ordinary soils possessed the power of separating from solution in water the different earthy and alkaline substances presented to them in manure. Thus, when solutions of salts of ammonia, of potash, magnesia, etc., were made to filter through a bed of dry soil, five or six inches deep, into a vessel, it was observed that the liquid no longer contained any of the salts employed. It has long been known, says Professor Way, that soils acquire fertility by exposure to the influence of the atmosphere.

Clay is so greedy of ammonia that if air, charged with carbonate of ammonia, so as to be highly pungent, is to pass through a tube filled with pulverized clay, every particle of gas is arrested. Liebig says: "If ammonia or salts of ammonia increase the product of a field, their effect depends upon the nature of the soil." We mean that ammonia can engender in the soil no potash, no phosphoric acid, no silicic acid, no lime; and if these substances, which are indispensable for the development of plants, are not found in the soil, the ammonia cannot produce any effect whatever. Kroker, in 1846, determined the nitrogen in 22 kinds of soil, from various districts, and he discovered that even an unfruitful sand contained more than 100 times, while in arable soils, to a depth of ten inches, there were present 500 to 1000 times more nitrogen than is necessary for a good crop. I have given these facts to show that manure should not be valued for its ammonia, but for its phosphates and mineral elements.

I have known a man of more than ordinary intelligence, who buried a horse and planted a grapevine over it, and after a few years of sickly growth the vine died, and he condemned the variety as not being healthy.

How very frequently we see trenches filled two to three feet with strong manure, then one foot of soil for vines to be planted in; when, if we would closely observe, that manure has to be decomposed and absorbed by the soil or some absorbent, and then given out to the roots in very small particles.

I would be pleased to have reported extracts from Dr. H. Maron on Japanese husbandry, but time and place would not permit, but hope all will read them. I would recommend the careful reading of Liebig's chemistry and natural laws of husbandry.

With a few words about saving and preparing manure, I will close. Every one that cultivates a rod of soil should have a compost heap, and the larger the farm the larger should be the heap.

Let the manure pile be near the barn, under cover, to prevent the rain from washing away the solids, then you can collect all vegetable refuse, leaves, muck, ashes, lime, old leather, all excrements and fluids from house and barn. Also all refuse salt, turf and the soil, where it can be removed, where roads are made, buildings set, also charcoal, well pulverized. This compost should be turned over and well stirred together at least four times a year. The finer it is rotted the better; care should be taken to prevent seed from being spread on the soil; manures should be at least one year old, and the older the better; bones should be ground to powder or dissolved with potash or acid.

Plow deep; underdrain, and keep the surface well stirred. Your compost can be used as a top dressing to the greatest advantage; but remember that the finer the particles of manure the more easily they will be absorbed by the tender, fibrous roots.

With an earnest desire for criticism and discussion on this subject, I submit this very imperfect essay for your careful consideration.

Dr. C. W. Spalding: There are some points in this question of manures that it is of importance to consider. We may start out with the proposition that manures contribute to the growth of plants by the "spongioles." The leaves grow mostly from the atmosphere; the spongioles draw most of their nutriment from the soil; they hold the same relation to the roots that the leaves do to the branches of the plant. Spongioles are formed and decay, like the leaves of the plant. These manures cannot enter into the sap in a solid condition; in order to enter into and contribute to the plant they must be in a state of solution, these spongioles having a delicate covering over their mouths, so as to refuse gross articles that are not in a condition for assimilation. We have thus the processes of "endosmosis and exostomosis." This is well illustrated by the saline particles passing through a membrane placed in a vessel of water. We must have the manurial elements in the soil in a proper condition to be available by the plant, and this cannot be unless in a state of solution.

Dr. Clagett thought that while these remarks were, in the main, correct, they might confuse those who had not examined the subject. There is a sense in which manure may be valuable in an insoluble condition, by the action of the plant upon the particles and by the more purely mechanical action on the soil.

On motion, adjourned till Friday morning at 9½ o'clock, in order to visit the wine house and vaults of the American wine company, and to give place to a meeting of those desirous to form a grape growers' association in the evening.

FRIDAY MORNING.

The meeting was opened with prayer by Mr. T. R. Allen.

Mr. Clagett, from the committee on wines from other fruits, made the following report:

L. D. Votaw, one sample of blackberry wine, manufactured by using one hundred and twenty-seven pounds of sugar to the juice of thirty-seven gallons of berries, the balance water to fill a forty gallon cask. Very good, but not as fine as another sample he presented, made with one hundred pounds of sugar to the juice of twenty-seven gallons of blackberries, the balance water to fill a forty gallon cask; also, one sample of strawberry wine, a very good wine, but will be improved by age. All being of the past season make.

There was, also one bottle of Catawba brandy from the American wine company, of high proof and good quality, but needed age to take off the fire.

All of which is respectfully submitted.

H. CLAGETT, *Chairman.*

Mr. Husmann, from the committee on fruits on the table, made the following report:

Your committee beg leave to report that the display of fruits on the tables was finer than ever before; the samples presented were generally fine and well preserved, and give very encouraging evidence of progress. But your committee is aware that fine as the display was, it could yet have been much larger and better, if all the members had tried to contribute something, as they undoubtedly could.

We have tried to notice all. Should, however, anything on the table have been overlooked, the blame must fall on the exhibitors, as they did not furnish the committee with lists of their fruit as they ought to have done.

The finest collection on the table was from Mr. T. R. Allen, of Allenton, St. Louis county. Mr. Allen exhibits Rome beauty, rambo, Smith's cider, good; Ortley, Swaar, Wagener, Rawle's janet, very good; Newtown pippin, Michael Henry pippin, winesap, best; all good specimens and well preserved.

The next best collection on the table was from Mr. O. H. P. Lear, of Hannibal, including Peck's pleasant, small romanite, limbertwig, little winter pearmain, good; Ortley, Rawle's janet, very good; white winter pearmain, winesap, best.

Mr. B. W. Davis, of Belleville, Illinois, also presented a fine collection, including fallowater, small romanite, limbertwig, Smith's cider, good; yellow bellflower, and sweet apples, supposed to be Jersey sweet, autumn swaar, and a variety unknown to your committee, very good; white winter pearmain and Newton pippin, best.

From St. Louis fruit house—Yellow bellflower, Prior's red, Rawle's janet, Newtown pippin, Duchess de Angoulême pear, and a variety of

pears unknown to your committee; Concord and Catawba grapes. They find that the grapes had well preserved their outward appearance; Concord had lost nearly all its flavor and sweetness; Catawba had lost but little. The pears were very insipid and the apples were excelled by others on the table kept in the ordinary way.

Mr. Pettingill, of Bunker Hill, Illinois, exhibits Newtown pippin, winesap, small romanite, and an unknown variety.

By Jasper Turner, of Hannibal: Rawle's janet, winesap, white winter permain, lemon pippin.

By J. Snedeker: Long Island pippin, very good; Newtown pippin, best.

By F. Finn: Willowtwig—erroneous; not worth a name.

By unknown exhibitor: Huntsman favorite; good, but not especially desirable.

Chinese quince, exhibited by Dr. Edwards, grown in Louisiana; very showy and well preserved. The preserves exhibited were, in the opinion of the committee, more acid and more tender, but have not as much flavor as that from the orange quince. Should the tree prove hardy here, and ripen its fruit, we think it very desirable, on account of its good-keeping qualities and handsome appearance.

W. S. Jewett exhibited a tray of the nuts of the "nuphar" (yellow pond lily or spotted dock).

The president and secretary both took exception to Jersey sweet, that fruit ripening in August and September.

Mr. Husmann: All of that lot of fruit was in a most superior state of preservation. That weighed against the doubts of the committee.

Dr. C. W. Spalding, from the committee on wines, presented the following report:

The committee charged with the duty of examining the wines on exhibition, respectfully submit the following report:

The list of wines on exhibition is as follows:

By George Husmann, of Hermann, Missouri, vintage of 1865—Catawba, Concord, Norton's Virginia, Herbemont, Cassady, Delaware, Clinton and Hartford prolific.

Vintage of 1866, same exhibitor—Concord, two samples, varying in color; Herbemont, Cassady, Cynthiana, Hartford prolific, Cunningham, Taylor's bullitt and Roger's hybrid No. 1.

By Michael Pœschel, of Hermann, Missouri, vintage of 1866—Catawba, Concord, Rulander, Herbemont and Norton's Virginia.

By American wine company, of St. Louis—Catawba, Norton's Virginia, Imperial (sparkling) and Catawba brandy.

By Francis Langendorf, of Hermann, Missouri, vintage of 1865—Catawba and wine from a new and yet unnamed grape. Vintage of 1866—Concord and Norton's Virginia.

B. F. Braches, of St. Louis county—Catawba of the vintages of 1865 and 1866.

By L. D. Votaw, of St. Louis county—Concord, vintage of 1866.

By Messrs. Eisenmeyer & Bro., of Mascoutah, Illinois, vintage of 1866—Concord, two samples, Norton's Virginia and Taylor's bullitt.

By Nicholas Green, of Gasconade Ferry, Missouri, vintage of 1866—Catawba and Norton's Virginia.

Exhibitor unknown—Two samples marked clear grape juice, one of which possessed the distinctive flavor of Clinton and the other of Catawba.

There was also one sample marked Cunningham, which proved to be the product of that excellent fruit, the blackberry. It was passed to the committee in charge of wines of that class. The Catawba brandy before mentioned was also placed in the hands of the same committee.

WINES OF LIGHT COLOR.

There were five samples of Catawba of 1865. That shown by Geo Husmann was judged the best, and that from the American wine company, a beautiful wine of very light color, second. Catawba of 1866, three samples. That from F. Braches was pronounced best. The samples from Michael Pœschel and Francis Langendorf, having a tie vote, second. It is proper to state that the sample of this variety from Nicholas Green, a very good wine, did not arrive in time to compete with the others.

The samples of Hartford prolific were of second rate quality. In the opinion of your committee this variety must always hold an inferior rank as a wine grape.

Of Herbemont the samples were all excellent. That from George Husmann best; second best, Michael Pœschel. This wine is destined to take a high rank as a white wine, comparing favorably with the finest light Rhenish wines.

Two samples of Cassady, by Mr. Husmann, a very good white wine, though not to be compared with the last mentioned, is still a wine of good body and of much promise.

The same remarks will apply with equal force to the Taylor's bullitt. Of the two samples, that by George Husmann was best, and that by Eisenmeyer & Bro. second.

One sample each of Cunningham and Delaware, also by Mr. Husmann, sustain the previous high character of both these varieties.

One sample Rulander, by same exhibitor, was also regarded as a wine of decided merit.

Roger's hybrid No. 1. This is believed to be the first sample of wine made in our state from any of the many valuable varieties produced by Mr. Rogers. It is a heavy wine, of light color, possessing a peculiar, decided aroma, promising to become a valuable addition to our existing varieties and well deserving of further trial.

RED WINES.

Concord—One sample only, of the vintage of 1865, shown by Mr.

Husmann. A good table wine, superior to most of the clarets brought to this country, and, in the opinion of your committee, a wine destined to supersede them in our markets.

Of the nine samples of Concord of 1866, that shown by Michael Pœschel was considered best, and that by Francis Langendorf second.

Norton's Virginia, vintage of 1865—That shown by George Husmann, best; that by American wine company, second.

Vintage of 1866—That belonging to Nicholas Green, best—a very superior article; second best, Michael Pœschel, also an excellent sample.

Clinton, vintage of 1865—Best by unknown exhibitor; second, by George Husmann.

Cynthiana, 1866—By Mr. Husmann, a very excellent wine, superior to Norton's Virginia, and regarded as the best wine ever exhibited before this society. Your committee are aware that in placing this wine above Norton's Virginia they are awarding to it the very highest praise, but judging from the sample before them, and allowing for the smallness of the quantity yet made of this variety, they believe they do no injustice to the Norton in assigning a superior place to the Cynthiana.

A sample of wine, of light red color, from a new seedling produced by F. Langendorf, seemed to possess no superiority over other well known varieties. It is no doubt suited to some tastes, and will be regarded as an acquisition, inasmuch as it increases the list of good wines, and is quite unlike any other variety known to the committee.

Imperial, shown by the American wine company—A superior sparkling wine, which appears to consist of mixed varieties.

The wines exhibited were of fully average quality, a portion of them being very fine. The past year's experience but adds to our confidence in the brilliant future for the wine interests of our state.

The secretary stated that the samples of wine sent by Mr. Braches were not sugared at any stage. That, to his knowledge, Mr. Braches had used charcoal as a substitute for sugar, by filtering his must through sand and charcoal. He thought that by this means much of the acidity was neutralized; his wines were very good. The secretary had forwarded samples of wines and soil of the vineyard, with notes on the training of the vines and treatment of the wines, to the department at Washington, D. C., in compliance with a circular from that office; but, excepting the letter acknowledging the receipt of the articles, no notice had been taken of them, although several years since.

Mr. Husmann: Charcoal and sand may affect the fermentation, but cannot be a substitute for sugar.

Dr. Spalding: Where acidity is in excess, some alkali might be used to check this acidity. But in the use of these, nice chemical tests will be required. If the must will stand the acid, it may stand the alkali.

Mr. Husmann: Will this use of alkalies not have an injurious effect on life?

Dr. Spalding: If used just to the extent of neutralizing the acid, they may be safe. If used in excess, it will be more than an excess of acid.

Rev. Dr. Peabody, from the committee on the fruit preserving house, presented the following report:

The committee appointed to examine and make report concerning the St. Louis fruit preserving house, beg leave to submit the following report:

By invitation of the worthy president of the St. Louis fruit house company, S. Kellogg, Esq., the committee paid a visit to the above named establishment, where they were received and courteously conducted by that official through the establishment, and everything connected with it was freely and fully explained. The structure of the house, the principles on which rest all expectations of success, the means adopted to apply these principles practically, the chemical agents and absorbents, were all exhibited, as well as specimens of fruits within the house for preservation.

To make our report brief and comprehensive, we note:

1. The method relied on by Prof. Nyce's patent, under which this company has been organized, is not to introduce into the body of the fruit any foreign agent, such as salt, sugar, creosote, etc., which preserve the organic vegetable tissue by chemically changing its nature, nor to use heat, which, by expelling the air, creates a vacuum in which the fruit, with the loss of color, consistence of flavor, reposes indefinitely without decay, but it is done by removing or rendering inactive the agents of destruction, which are the following, viz: Heat, light, impure vapors, moisture and oxygen.

2. Before proceeding to describe the fruit preserving house and what they saw in it, your committee would state in general the methods by which these destructive agencies are removed.

Heat is neutralized by the use of ice, applied in the manner hereafter described, by which an even temperature of about 34° Fahr. is preserved through the whole year. Light is kept out by having no windows to the house, and keeping the double door shut. Impure vapor is avoided by allowing nothing in the building which can generate it. Moisture is summarily and pretty effectually removed by covering the floors, and as many other horizontal surfaces as necessary, with powerful chemical absorbents which take up from the surrounding atmosphere all its free moisture emitting any disagreeable odor.

Your committee observed that the absorbent used in this establishment was the chloride of calcium, or dried bittern, a substance left in the tanks used for the manufacture of salt. This substance absorbs not only the natural moisture of the atmospheres, but that which is emitted from the ripening fruit. The removal of that subtle and de-

structive agent, oxygen, is the only remaining task, and your committee are disposed to think the principal difficulty. The method relied on for practically accomplishing this, is by making the space containing the fruit, from which heat, light, impure vapor and moisture have already been excluded by methods above mentioned, as nearly air tight as is practicable, and then allowing the carbon or hydrogen developed by the ripening fruit to unite with or take up the oxygen of the surrounding air. The product of the first union, i. e., of carbon and oxygen, is carbonic acid gas, which, filling the spaces around the fruit, is entirely harmless for its injury or destruction. The product of the second union, i. e., of hydrogen and oxygen, is water or moisture, which upon being evolved, is instantly seized upon and devoured by the chloride of calcium on the floors. Mr. Kellogg informed your committee, and they have no reason to doubt his statement, that a room filled with fruits and kept shut up a few days, would be filled with an atmosphere in which a candle would instantly go out, showing a removal of the oxygen of the air.

3. Having briefly described the methods by which the fruit destroying agencies are neutralized and removed, your committee will now speak of the fruit preserving house itself, and its internal arrangements. It has been completed but a short time, and stands on the east side of Third street, near Plum. It stands on the ground fifty by seventy-seven feet, and about twenty-five feet high. The ground was first made perfectly level, and pounded down even with the top of the foundation walls. On this was spread a covering of tar and pitch half an inch thick, to exclude all moisture from below. Upon this impervious covering stands a stratum three and a half feet thick of short dry shavings or chaff, and above this the water-tight metallic floor. The building has all around it two walls, also metallic, three and a half feet apart, between which is also placed the same light non-conductors of heat. These walls are carried up about twenty-five feet, and filled in between in the same manner. The roof is constructed in the ordinary manner, of joists and timber. A space over the whole structure, directly under the roof, and from six to eight feet deep, is divided off from the space below by a water-tight galvanized floor. This space between this metallic floor and roof is filled with ice, with the ordinary covering of sawdust on top for its protection. By this arrangement the space for the reception of fruits is surrounded on the four sides and bottom by three and a half feet in thickness of chaff or fine shavings, and on the top by solid ice from six to eight feet thick. Through the middle of this space thus surrounded runs a hall about seven feet wide, and on each side of this hall are five rooms, each with a door opening into the hall, and all separated from each other and from the hall by metallic partitions, air-tight. The doors are all tightly listed, so that very little air can pass through them. Each of these rooms, all similar, is about fourteen feet high, fifteen and a half wide, and seventeen feet long, affording a space in-

side for storing fruit equal to 36,900 cubic feet, and supplied with tables, stands and shelves for the reception of fruits. In the partition between each room and the hall is a small glass window, made and fitted in air-tight, through which is exhibited a thermometer marking the temperature within. The entrance into the frigid regions, thus divided up for the convenient storage of fruits, is by two doors, one of which must be closed behind the person entering before the other can be opened. The whole expense of the house thus far has been $18,000.

4. What your committee saw inside. Entering the establishment in company with the great mass of the members of the society, your committee had not quite so good an opportunity for examining the contents of the house as could be desired. They saw apples and grapes in a perfect state of preservation, the latter more plump than any specimen of this fruit ever seen at this season of the year. The two boxes of grapes on our tables from this house present ample evidence that the grape can be kept in good condition by this process far beyond its season.

Your committee were informed by President Kellogg that large quantities of lemons, although put into the house last spring late and in bad condition, were kept several months beyond the time at which this fruit usually disappears, and that strawberries, raspberries, as well as summer apples and summer pears, had been kept free from decay for several weeks.

Your committee do not hesitate to express the opinion that apples, grapes, and other fruits with thick, impervious rinds, may be preserved by this means through the entire year; but whether peaches and other delicate summer fruits will thus submit to Prof. Nyce's patent, your committee have considerable doubt. If these fruits, in addition to apples, lemons, oranges and grapes, could be kept but a few months beyond their season, it would be a valuable acquisition to the fruit loving community.

In reference to the extensive use of this method of preserving fruits, and its general introduction among fruit growers, your committee will only add that, aside from the amount necessary to be paid for the use of the patent, a house suitable for a small fruit farm, ten feet square inside, and holding two hundred and fifty bushels, will cost, at present prices, about four hundred and fifty dollars.

In conclusion, your committee are unanimous in expressing the belief that the introduction of this method of preserving fruits will be of great benefit, both to the producer and consumer. It will spread the delicacies of the summer garden over several of the less sunny months of the year. It will force teeming autumn to unlock her golden treasures in the icy lap of winter. It will have a tendency to stimulate fruit raising, for it will enable the fruit grower to make his contracts before hand for fruits to be delivered on a particular day, and thus, in a measure, choose his own time for putting his choice

wares upon the market. It will also stimulate the consumption of fruits, for it will spread them over a larger space of time. As an example, if grapes can be kept through the year, and afforded to the consumer in all the winter and spring months at a moderate cost, it will more than quadruple the quantity required for consumption.

CHAS. PEABODY,
G. C. SWALLOW, } *Committee.*
E. S. HULL,

Dr. C. W. Spalding expressed his satisfaction with the report. The point made in the report in regard to "thick-skinned fruits" was exactly in accordance with his observations on this subject here and elsewhere.

He doubted if they were adapted to retain in its excellence the flavor of the pear, peach or grape. The specimens before us bear out that idea. I visited a fruit house in Covington, Kentucky, and they there informed me that articles kept with most profit were apples, lemons and butter.

Rev. C. Peabody: In reference to the remarks of the gentleman I think they are correct. The committee had no opportunity of testing any samples of fruit, and of course could not say anything on that point in the report. I think the remarks are very proper and just; it was on the house the committee had to report.

Prof. Swallow: In reference to fruit houses, if we find they answer the purposes designed, it is well to encourage them. I am building, this season, a house on another principle, covered by no patent, that I think will do as well, without almost any other outlay than of material found on the farm, except pine lumber. This house has not varied two degrees from 35° Fahr. It is built of sun-dried brick, laid with a mortar composed of equal parts of sand and clay. Bricks made six inches thick, two six-inch walls, and a six-inch air space between. Put two coats of whitewash inside, and "rough cast" it outside. A house ten feet square will not cost, in all, $200.

Mr. J. H. Tice, chairman of the committee of agricultural colleges, read a report.

REPORT.

The special committee on agricultural college, to which was referred the letter of the Hon. N. J. Colman, and preamble and resolutions offered by Dr. Morse, having had the same under consideration, beg leave to submit the following as the conclusions they have arrived at, both in reference to the establishment of an industrial college, and the special matter referred to them.

Prior to the passage of the act of Congress donating lands for the establishment of industrial colleges in the several states, we heard nothing from universities and colleges respecting industrial chairs, or industrial or agricultural departments in those institutions. In fact,

in several instances, when wealthy and liberal citizens proposed to endow such chairs, the propositions were received with derision. In their opinion, to give a classical and scientific education and training, to make lawyers, doctors and ministers, was a good thing, but to make tillers of the soil by giving them the same advantages, was not only absurd, but ridiculous. While these classical institutions were illuminating "upper tendom," light was also radiating from the people's colleges—the public schools—which was enlightening the lower strata of society. Beneficent as was the influence of these popular institutions, they were found inadequate to supply the literary and scientific wants of those engaged in the various and complicated industrial pursuits. They served only to show how thick and gross was the mental darkness that enshrouded the producers of all the necessaries, luxuries and wealth of nations. The glimmering light, dark as was the night, revealed one fact: that there was a reason for everything under the sun; that, whatever shape their industry might take, it could not escape from the controlling power of universal laws. Science could unfold to them the mystery of these laws, and how to place themselves in such relations to them as to become co-workers together. But there were no institutions where special education was given to make scientific cultivators of the soil, mechanics, etc., as there were to give special education to make lawyers, doctors and ministers. When these higher literary institutions were applied to for establishing industrial chairs, they not only refused, but ridiculed the idea. Refusal, however, did not defeat the movement; it only made it take another direction. Since the existing colleges refused to furnish the desired education, colleges must be established for this special purpose.

If there is any obscurity in a law as to its intention, lawyers, to elucidate that intention, go back and ascertain the condition of facts at the time of the enactment of the law, in order to ascertain upon what it was to operate, and hence infer the intention of the lawmakers.

There is no ambiguity about the law of congress. It expressly states its intent to be for the establishment of industrial colleges. There are, however, some who strive to mystify its express provisions. To these we oppose the statement of facts (which are undeniable) as they existed at the time, and which induced the congressional legislation. For more than twenty years prior to the passage of the land donation act by congress the subject of industrial education was agitated, especially in the northern and middle states. If any one doubts this, let him examine the proceedings of agricultural and horticultural societies, especially those of state boards, and he will find industrial education the theme and burden of many lectures, essays and committee reports. The citizens of several states had gone even so far as to establish agricultural schools and colleges. These, being in advance of the general intelligence of the age, languished for want of support or of sufficient endowment. The Pennsylvania agricultu-

ral college was one of these. The languishing condition of these colleges originated the idea of asking congressional aid for their endowment. Friends of industrial education from the northern states exerted themselves to enlist the popular sentiment and feeling in favor of the project. They also sent deputations to Washington to urge it upon congress. One of the trustees of the Pennsylvania agricultural college, then a member of congress, took a leading part to induce congressional action, and some of his colleagues in the board of trustees made several visits to Washington, for the same purpose. These were the facts as they existed, and constituted the matter upon which the law of congress was intended to operate. After the passage of the law almost every college in Pennsylvania claimed a share of the fund, and clamored for a division of it. The late lamented Dr. Pugh, then president of the agricultural college, after an arduous conflict with them, finally defeated a division of the fund, and mainly by opposing to it the unanswerable argument of its origin.

In the paper referred to your committee, they regret very much to find Mr. Colman, one of the ex-presidents of this society, who was regarded as entirely sound on this question, and who, in every way in proceedings heretofore, had committed himself to the integrity of the fund, and for a purely agricultural college, wavering on this great question, which so intimately affects the prosperity and welfare of the "great unwashed"—as Carlyle terms the industrial classes. He very frankly admits his change of position, and assigns his reasons for such change. His first reason is the assumed worthlessness of the agricultural college lands selected, which he believes will not average, on sale, fifty cents per acre; or, in other words, the 330,000 acres of land, will not yield a fund exceeding $150,000, the annual interest on which, at six per cent., will be $9,000. Since this would be a poor endowment for a college, he favors putting an agricultural department in the state university. In regard to the value of the land we will state that it is understood that the greater portion of it is selected from the railroad lands, or from the alternate sections with the railroad lands. By the act of congress donating lands to the railroads, the price of the alternate lands was to be double to congressional price, that is, two dollars fifty cents per acre. They will be contiguous to the railroad when built—none exceeding six miles. To be sure, since as far as the railroad lands are selected, there is but one-half the number of acres that there would have been if they had been taken elsewhere. Then the question returns, what is the intrinsic value of these lands? and how shall they be disposed of so as to realize the greatest amount of fund?

We have seen it stated that General Fremont, president of the southwest Pacific railroad, is selling the alternate sections of the railroad lands lying side by side with the agricultural lands for five dollars per acre, on a credit of five years, bearing six per cent. interest. Our inference, therefore, is that the intrinsic cash value of these lands is at

least from three to three and a half dollars per acre. Take the lowest figure and estimating only for one half the land—namely, 165,000 acres—it will realize $495,000, or say in round numbers, half a million dollars. Six per cent. on this will be $30,000 annually. But it does not follow that we must sell for cash, especially when we cannot use that cash excepting as principal to be let out at interest. The state of Iowa has sold her agricultural college lands on ten years' credit, at eight per cent. annual interest. Missouri can do the same, and even better. She can sell—say due in ten years—at eight per cent. with an indefinite credit afterward, as long as the purchaser may desire. If this plan be adopted your committee believe a fund of from one-half to three-quarters of a million of dollars can be realized from these lands, bearing eight per cent. interest.

The next reason assigned for his change of sentiment is, that citizens of Columbia will donate two or three hundred acres of land for the agricultural farm, and that the state university buildings are already there.

We are ever ready to acknowledge our indebtedness to the citizens of Boone county for their former liberality in promoting the cause of education in Missouri, by the munificent donations made for establishing the state university; and we are glad to hear of their continued liberal disposition in the same great cause, but we do protest against closing the door to other counties, denying them the privilege of likewise showing their liberality and manifesting their appreciation of education, especially of industrial education, which so intimately affects the welfare, prosperity, and happiness of the masses, whose claims to education have been so persistently denied heretofore. We therefore ask that no donation, however liberal it may be deemed, be accepted until ample time has been given to all parts of the state to compete for the location.

The last reason is, that the new constitution requires an agricultural department in the state university. One thing, however, the constitution does not require: that, to establish it, the congressional fund donated for establishing colleges for teaching the industrial and mechanical arts shall be taken. We have no objection to the state creating an agricultural department in the state university, or in all the colleges in the state, but we protest against its doing so by using the congressional fund.

The committee, therefore, beg leave to submit the following resolutions for the action of the society:

1.—*Resolved*, That the Missouri state horticultural society, representing a large and growing interest of the state, and one of the most important branches of agriculture, do earnestly and solemnly protest against the division of the agricultural fund.

2.—That we are now, as we always have been, in favor of the industrial college to be an independent institution, separate and disconnected from any college or other literary institution, for the reason

that we believe such to have been the intention of congress, and that it will best promote the object intended, and the interest of the industrial masses, for whose benefit the donation was made.

3.—But that, should the industrial college be located in connection with or entirely separate from other institutions, it should be entirely independent and have a separate board of management.

4.—That it is the opinion of this society that, by a prudent management of the lands, and of the proceeds of the sales thereof, a rich endowment can be realized for sustaining an agricultural college that will not only confer great and inestimable blessings upon our industrial classes, but will be a credit and honor to the state.

5.—That in order to give an opportunity to the people of this state to show their liberality, that the location of said college be left to open competition, to be assigned to that county making the best offer.

6.—That the best way for disposing of the lands will be by adopting the Iowa method, or something similar, and sell the same for a long credit, say from ten to twenty years, with annual interest of eight per cent. per annum.

7.—That we most earnestly ask the representatives of the people of Missouri, in general assembly convened, representing as they do a constituency mostly agricultural and entirely industrial, to deal with this momentous question so as to conform to the wishes of those whose interests are to be affected by it, and to whose instrumentality the fund in question owes its existence.

8.—The foregoing report and resolutions express the wishes and desires of the horticulturists in convention assembled, and as we believe of all the industrial classes in the State.

All of which is respectfully submitted.

Prof. Swallow objected to the report as making a discrimination against a single institution—the state university. We can say "any institution in the state." Why point out one institution and leave out all the others? Why this idea that literary professors should be kept out and have nothing to do with it? Why exclude Boone county from competition for the location of this college? When the state was poor, and went to erect a university, Boone county nobly came forward and gave a hundred and twenty thousand dollars in cash, and not another dollar has been paid from that day to this to sustain this university. I am no advocate for Boone county, but for consistency in this society. The literary, scientific, intelligent men of this society should, above all other men in the state, not be narrow-minded. This old county, Boone, deserves the thanks of this society for their noble conduct in behalf of the education of the state in the time long past. Boone county is not controlling this institution. The state manages the university; Boone only pays the money, and we want it still so.

One class in agriculture has graduated in this university, and sent out a class of sixteen as fine, well qualified young men as ever left an

institution. Sixteen years ago a professor in one of your colleges wrote an address on this very subject, which was published in the Democrat and Republican, and, with some slight modifications, by the agricultural and mechanical association of St. Louis. These things being so, I think it ungenerous in this society to especially point out this university and this county with so much invidiousness, and as one of the first members of this society, I wish to prevent it taking this wrong position. As far as the having an independent college and management is concerned, I agree with the committee. I think the gentleman who wrote the article in last year's state report on agricultural colleges deserve our thanks. It is the best article that has appeared on the subject.

It has swept away the trash that has been tried as arguments against it. In 1849 I was appointed to take charge of such an institution at Ovid, and would not. I had just gone through such an experiment in Maine; it failed there in 1848 for want of means. Now, we want to avoid the possibility of failure here. We want the whole fund, and as much more as can be gotten, and if Boone comes forward with the best offer, why should we exclude her? Why, if she gives most, should we not let her have it located there? I suggest that this portion of the report be taken out.

Mr. J. H. Tice: We do not want to do injustice to Boone county. It was brought in from its connection with the letter that called out this report. Will gladly strike out anything that would tend to injustice or wrong ideas.

Prof. Swallow: Do this or let the other colleges be named. Now I will unite on this point: "Let this society act upon general principles." Wherever these institutions are organized they should be as independent institutions; and if it comes to old Columbia it should be distinct, with a distinct board of management and distinct professors. If we should want a professor of chemistry, what objection can there be to having our university professor or the use of our university apparatus? If one man can act as professor to our college, and to three or four more colleges, can there be any reasonable objections? If we cannot pay alone a sufficiency to maintain good professors, why can't we unite and pay them? Another objection is, we cannot get the two classes of students to agree together. I will guarantee the farmers' boys will take charge of their own.

By locating it there we can save a part of the salaries of five professors. This will be a good point gained, everything else being equal, and we will save something worth while. We have the example of other states in the Union to guide us. Some of the states have united their institutions, a few others have them independent.

I should like the college to be located in St. Louis county, for I intend to make it my home; but because of this I need not try to injure any other county or control its action.

Boone county made the initiatory movement to establish these in-

stitutions. She made the attempt to found an agricultural college, but the action of the legislature, by influences from this city, broke it down. This experimental class of sixteen graduated in 1852, in this Columbia university. It was done by men in this institution. It had students from nearly every state from Texas to Maine, and some of the best men of our own state. Instead of being prejudiced against this institution, we should thank it. It is thought and asserted that our classical professors are against all such institutions. I think I have shown this not to have been the case in this instance, and hope that, like noble men, when we know the facts, will allow our feeling to change a little in regard to those men.

Dr. Clagett: I would like, as a member of this committee, to speak a few words upon this subject. This committee has not picked out Boone county. It was upon the phase in which the facts were presented to them that they based their report. What we mainly and emphatically want is a distinct institution, and having it under our own control, and not incorporated with any other institution. If Boone county tries to do her best we will give her thanks but whether located in Boone or any other county, it must be distinct.

Report was, on motion, recommitted to the committee, and Prof. Swallow added to the committee.

Dr. Clagett read an essay on

MARKETING OF FRUITS.

MR. PRESIDENT: In compliance with your request, I propose to bring before the society the subject of marketing fruits.

From the commencement of our organization, our chief aim has been to encourage increased cultivation of the best varieties of fruits, to supply the growing wants of our rapidly growing city.

Profits being a great incentive to engage in new enterprises, statistics have been collected showing the large profits of well conducted fruit culture. The best talent in the country has been brought into requisition to display its healthful influence and adaptation to promote moral and social refinement, as well as its commercial importance.

County, state and national conventions are in operation to keep the subject prominently before the people, and to stimulate increased production, till fruit culture has become the great question of the day; such is now the mania for tree and vine planting, that propagators, with the aid of steam, cannot supply the demand.

What is the main-spring to this rapid progression in one direction, engrossing so much talent, capital, and labor? Whatever natural attractions may surround this subject in this utilitarian age, it will be acknowledged that the hope of pecuniary reward is the chief incentive, especially with those who embark in it on a large scale, and that disappointment in that direction would give the most fatal check to the progress of fruit culture; for intelligent thought will not long continue to employ capital and labor where it does not yield a compensating reward.

These reflections bring us to the important question, how shall fruit growers secure remunerating prices for their products? The thoughtful observer cannot fail to discover that this cannot be done by the present system, or rather, want of system, in marketing fruits, but can only be done by a proper understanding and co-operation of the parties concerned.

It is to bring about that mutual understanding and to inaugurate the proper co-operation, that this subject is now brought before you, that we may be prepared to take the initiatory steps to correct the errors of the present practice, and thereby secure our common interest.

It is in our large cities that the chief portion of our fruits must find a market.

A plain statement of facts, that experience has developed in our market, will be sufficient to show the folly and damaging influence of the present practice, and demonstrate the necessity of a different mode, if we would hope for success.

It is well known that the fruit crop of the past year was unusually short, especially the crop of peaches and apples. In many localities it was nearly a failure, and only in a few a comparatively fair crop. Consequently, high prices were anticipated. But the sequel has shown that while a few obtained good prices, a large portion was sold at ruinously low rates, and considerable quantities rotted on the market, to be followed by a deficient supply and high prices; the loss falling chiefly on the producer and consumer, but few of the producers getting the partially compensating advantage of the high prices, as most of the fruit had passed out of their hands before the advance; hence, both producer and consumer are interested in finding a remedy for the evil.

The important question for our consideration is, can the recurrence of these losses be prevented, and the consumer supplied at fair rates, and the producer secured remunerative prices? We believe that to a large extent they can, which we shall endeavor to show; but to succeed shall require your patient attention.

The first and greatest difficulty we meet is the manner in which fruit is assorted, or rather not assorted, and not properly packed. This is the finishing of the fruit grower's work, and the failure to perform it in a proper manner is damaging to all the rest of his labor; and after determining the question of success or failure, for the profit is the small margin, and the loss of this by an imperfect finish is the loss on all his previous labor, experience has clearly demonstrated that while good fruit put on the market in good order will bring good prices, inferior fruit or fruit in bad condition will not pay even the expenses of gathering and bringing to market; and yet but few entirely escape this worst of errors. It is unsatisfactory to all concerned, but the loss falls heaviest on the party who commits it.

We could give numerous cases of losses by not properly assorting fruits, that have come under our observation, but one may suffice.

A commission merchant received one hundred and twenty-five barrels of apples in such a mixed condition that he was several weeks in affecting a sale at $1 75 per barrel. Each barrel contained from half a bushel to three pecks of fine large romanites on top, the balance large and small genitans, and other small and imperfect apples of different varieties, evidently put in to cheat. These apples were assorted and repacked and sold on a falling market, thirty barrels at $3 50, thirty at $3 00, and fifteen at $2 50, and fifty barrels made into cider. The eighty-five barrels brought $232 50, $14 80 more than the one hundred and twenty-five brought. Had the seventy-five barrels been properly assorted originally, they would have sold promptly for twenty-five cents per barrel more, for apples are always injured by overhauling and repacking, making $18 75 more. Add to this the cost of fifty empty barrels, with freight and charges on the apples at $1 25 per barrel, $62 50; fifty barrels of apples made into ten barrels of cider at home, netting $8 per barrel, $80, which foots up the loss on this shipment to $176 at the lowest estimate. Add to this loss on reputation for shipping fruit in such condition, $200, the delay, vexation and mortification, and you may approximate an estimate of the folly of such a course. We would say to all who are disposed to put up fruit in such a condition, don't send them to a responsible merchant to sell, but seek out some tricky fellow who is only temporarily in business, who has no character to lose. He may succeed in cheating somebody with them, and if he pockets the proceeds, all the better; the sooner such will be cured of their folly and the better for the public good. But perhaps you are ready to say this is an extreme case; but allow me to assure you that they are not so rare as you may suppose. There is another class of very good men who, from neglect or from trusting to careless employes, send a great deal of imperfectly assorted fruit. We do not exaggerate when we state that three-fourths of the fruit brought to market contains from one-third to one-fifth that damages the value of the other portion, and which had better been given to the pigs, or left in the orchard, or anything done with it rather than mix it with the better.

Take, for instance, five barrels at $4, reduce them to four, by taking out all the small and imperfect, and you raise their value to $5 per barrel, and thus save the cost of one empty barrel, freight, etc. There are other advantages in carefully assorting fruits. To appreciate them, go with us on 'change with carefully assorted and mixed fruits, and you will begin to appreciate their value. There fruit is bought to fill orders to be shipped to other markets. The sellers and buyers meet.

A has an order for 190 barrels choice winesaps; B for 100 genitans; C wants belleflowers, and D pippins. Remember, they all want choice fruits, for poor fruits will not pay shipping and reshipping.

You, as factor for the fruit growers, have all the varieties, but your winesaps and genitans are mixed, your belleflowers and pippins are not assorted, one-fifth are small and imperfect. Your neighbor has all

these varieties in a condition to meet the wants of the market. Now comes the practical test of value. The buyers come round; yours are the best lot on 'change, except the few small and imperfect ones, and the mixture of variety. You offer them at $4 50 per barrel, but your mixed lot is rejected, and as there is no telling how many are imperfect in the belleflowers and pippins, they are passed. Your neighbor can guarantee his all right according to the sample, and are sold at $5 per barrel, and the purchaser hands the seller a card with the marks to be put on the barrels directing to send them to the boat, and the dray ticket and bill to his office, and the transaction is completed. You, unable to effect a sale, return with your samples to repeat the same process the next day with like results, and, perhaps, for several days, for you dare not misrepresent them. If you did, your sale would involve you in reclamation, and you would lose caste on 'change, and your representations would not be taken when you had fruit in the proper condition. You are, therefore, obliged to sell them on their merits, and, by offering them at a reduced price, induce some speculator, who is prepared to overhaul them, to go and examine them in store; and this you may do several times before making a sale. In the meantime your neighbor has sold a dozen lots with one-fourth the labor.

We have dwelt thus on this part of the subject because it is the particular torment of the commission merchant and a serious loss to all concerned, and yet half the evils of neglecting to assort and pack fruit in the proper manner have not been told. But fortunately the remedy for this very grave error is very plain and simple, and within the reach of every fruit grower. First, never mix varieties; second, assort into three qualities. Pack the first and second qualities tight, which you cannot do without a screw; carefully mark each barrel, designating variety and quality, and send your factor a true statement of the varieties and qualities according to the marks, that it may not be necessary to open every package to know what it contains. The neglect to do this gives a great deal of unnecessary trouble in opening packages. A line of confidence should run through the whole business. Each fruit grower should be able to sell on the reputation of his brands. Sales can then be made promptly, and with pleasure and profit to all parties. But how will we prevent these extreme fluctuations in prices? This will be done in part by sending the fruit in a better condition, and the inferior leaving at home and not choking the market with unsalable fruit. But there is another error not so easily remedied, which can only be done by a prudent co-operation of the fruit growers with his factor, by which the supply may be better proportioned to the demand, which will always regulate the price. To appreciate this part of the subject, it will be necessary to compare the present mode of selling fruit with what it might and ought to be.

To state the present practice of selling fruit and the embarrassment, loss of time and labor attending it, would be a task equal to

attempting to describe chaos. But justice to the subject demands that we should endeavor to convey some idea of it. This we can best do by tracing its practical workings.

There are several hundred commission merchants in this city. Some of them deal chiefly in flour and wheat, others in corn, oats hay, etc., some in tobacco, others in groceries. Each has experience in the particular line of his business, and acquires a knowledge of the qualities and relative value of the articles, and is posted in regard to the supply and demand; gets a regular run of custom, and is prepared to give his regular business due attention. Now, fruit is shipped indiscriminately to most of these merchants. Some of them receive but a few shipments during the year, and but few, if any, receive anything but a regular supply. Now, suppose there were three thousand barrels of apples in the market, and they were scattered indiscriminately for a mile up and down Second street and the levee, and on the upper and lower part of Main street, and some on the cross streets.

Now, suppose you want to buy one hundred barrels, where will you go to find them? You look over the receipts by rail and river, and you find A has received 500 barrels; B, 200; C, 300, and D, 50; the rest have been in store several days, but you don't know where.

You go to A; his are yet on the boat. You go half a mile to B; he has just sold. You next go to C; he will only sell the round lot; and go to D, and you will find his in bad order. It is now time to go on 'change. You there find a number of samples. Some will only sell in round lots; some are not the kind you want; others cannot vouch for their quality, and you spend the afternoon in going from place to place, opening barrels, examining lots; some are mixed, some in bad order, and others not the kind you want, and thus the day is spent and nothing accomplished, perhaps to be repeated the next day with like results. Now, it is very clear that this random practice is not adapted to accomplish the object desired. Most of these merchants will tell you that the fruit trade is out of their line of business; that it gives them a great deal of trouble and does not pay; that they only do it to accommodate their customers who ship them other products.

The sale of articles out of their regular line always gives them extra trouble, and especially when the article is abundant. Fruit cannot be inspected like flour or sampled like wheat, corn and oats. If a merchant has a lot of fruit that he cannot vouch for its quality or condition, he cannot sell it by samples on 'change to advantage, for if the purchaser buys the pig in the poke, he must have a wide margin, which will not be satisfactory to the producer; he must, therefore, sell it on its merits, which can only be ascertained by opening every package (to do which you may have to travel half a mile), and turn over and pry into the middle, and when the factor has done this for the eleventh time, without making a sale, the fruit and package damaged by the operation (for the package must be closed after each examina-

tion, or the best of the fruit will rapidly disappear; he cannot stand by and watch it, and if he did it would be difficult to keep all hands off), he is ready to close sales at the speculator's figures (for his trade under such circumstances must be confined to that class), and thus get rid of a troublesome and unprofitable job, hoping he may never receive another such shipment.

The remedy for this random practice is mainly in the hands of fruit growers themselves. Many of them have embarked largely in fruit culture, and are looking to it as the chief source of their income. The rapid increase of fruit culture is beyond all precedent. To secure them remunerating prices, consumption must keep pace with supply. Consumption will increase in proportion to the regularity of the supply and ease of access. The more direct it can proceed from the producer to consumer, the better for both parties. To meet these ends it should flow through regular and well-known channels. All that is necessary is to put it into the current, and it will flow with certainty to its destination, and the reward will as certainly return.

The question to be determined is, are we prepared, and is it to our interest to organize and sustain such channels? This is a question of interest not only to the producer and consumer, but connects with the general commercial prosperity of our city, and therefore every citizen is interested in its proper solution, whether he be producer or consumer, or neither. In our neighboring city of Chicago, quantities of fruit are daily disposed of, the half of which would be lost in our market, not for want of consumers, but for the lack of regular channels through which it would flow within their easy reach; there the trade is organized and confined to well known channels, to commission houses who make it their chief business.

There half a dozen carloads of strawberries in the season arrive daily, and disappear with almost as much celerity as the passengers on the trains are distributed to the different hotels or passed to other trains.

Now, the unitiated would ask how such quantities could be so suddenly disposed of, but there is really no mystery about it, but simply the business is confined to men who become acquainted both with the supply and demand, and are prepared to regulate the price accordingly.

To dispose of small fruits profitably they must do it promptly, as they cannot remain long on the market without becoming stale and unprofitable. It does not take long to reduce the value of such fruit as strawberries five cents per quart, which, in clear profit, is sufficient to make the difference between success and failure.

To appreciate a well organized fruit market, let us trace its practical working, for it is necessary that all the parties engaged in it should understand it to work it successfully, for failure of either of the parties to perform his part will cause derangement, attended with loss. We now propose to state the part to be performed by the fruit grower,

and as he will be the heaviest loser by any derangement, it is his interest to see to it that he performs his part well. Fortunately, his part is plain and easily understood. Now, let us suppose that each fruit grower selects his factor, through whom he proposes to sell his fruit, commencing with the strawberry crop.

Having selected his factor, he should inform him in advance of the probable amount he expects to send in the hight of the season.

The factor's duties are much more complicated, but being in possession of the requisite information, he is enabled to make an approximate estimate of the work before him, and should put in trim the necessary machinery to put it through promptly; and if he has his trains all properly laid and kept in good running order, he will dispose of 10,000 gallons in the same time he would 5,000, if he had only arranged for that quantity, just as a farmer may put up a hundred acres of hay in as short a time with the requisite machinery, as he would fifty with proportionately less preparation. If, being prepared for the sale of only 5,000 gallons, and he has 10,000 thrown upon him, he will be overwhelmed, and a part must suffer, just as the hay would suffer if the farmer should be called upon to cut one hundred acres with the preparations made for fifty; on the other hand, if the factor had prepared for 10,000 gallons, and only received 5,000, he would lose, and his customers, relying in him for their supply, would be disappointed and the business deranged. Hence the necessity of a definite under standing and co-operation of the fruit grower with his factor.

We suppose the fruit is now beginning to ripen, and the parties are ready for their work; the fruit grower has his packages provided; his factor has his correspondents provided in all the markets to which the fruit he is to receive may go. From his experience he is enabled to make a close estimate of the per cent. of consumers that will pay one dollar per quart—say a quarter of one per cent. As the supply increases the price is lowered, and the per cent. of consumers increases to meet it, till the whole community within the range of his operations become consumers, if the supply becomes sufficient to bring down prices, and the fruit grower should be content, if it gets that low for a short season, that every family may have at least one good mess, consoling himself that the loss had made up to him in high prices the mite the poor have received.

Here we have the price governed by the natural law of supply and demand.

But we must not expect that this system will work to perfection (it will take time), particularly in the commencement, for it can hardly be expected that all fruit growers will sufficiently understand their interest in keeping their factors notified of their intended shipments, or always be prompt in sending forward the promised supply, or that all consumers will be prompt in taking the supply engaged, or that all factors will be able to meet fully the requirements of their position: or theirs is no easy task, for it requires a comprehensive head and a

broad pair of shoulders, for he will not only have to bear the complaints consequent upon his short-comings, but the faults of both the other parties; if the producer fails to send in the promised supply, and the consumer is disappointed, the factor bears the blame; and if the consumer fails to take the supply ordered, and in consequence the factor is obliged with extra labor to hunt another consumer to get it off at a reduced price, the factor again bears the blame.

Now, they should both appreciate the fact that he can only serve either with success as he acts with fidelity to both; if he is unfaithful to the producer, he will fail to get the supply, and if he deceive the purchaser, he will fail to get customers for the producer's products.

His position, his duty and interest all require him to do simple justice to both; for it is only by so doing that he can do justice to himself or either of them.

Mr. Pitts read a letter from a friend, a wine grower in Kentcky, upon the processes of wine making.

Mr. G. Husmann remarked that the first part was that often before described, and almost universally described; against the second part he entered his unqualified protest as producing only a vile drug.

Adjourned.

The session was opened by an essay by Mr. T. R. Allen, Allenton:

EDUCATION FOR THE PURSUIT OF HORTICULTURE.

The pursuit of horticulture is in itself pleasing and ennobling. It not only affords agreeable, wholesome and needful exercise to the physical man, but furnishes a delicious food most singularly adapted to his natural appetites, desires and wants. It also affords him a grand and inexhaustible field of healthful and pleasurable intellectual employment, while, at the same time, it exercises a most happy and ameliorating influence on his moral nature.

Thus we see, it is most happily adapted to our three-fold nature and character. What, in the the whole range of human pursuit, is so well adapted to man's nature as horticulture—or that in which the meaning of the term is included, agriculture? What a pity that this most noble and ennobling pursuit is so overlooked, under-estimated or entirely lost sight of by hundreds of thousands of our people, who crowd themselves into cities—already over-crowded—in the vain hope of engaging in a more honorable and profitable employment. Such ignorance and folly are indeed to be pitied. The farmer's son fancies that city life and city pursuits are more elevated and dignified than his own, and, consequently, afford more pleasure, profit or honor. Alas! in this false view, it is but too common that he is encouraged, either directly or indirectly, by older heads that ought to know better. What a pity that farmers thus unwisely under-estimate their noble calling—the chief corner stone upon which firmly rests the superstructure of all other human pursuits. While I would not be so in-

vidious as to under-estimate the real importance of the mechanic arts, manufactories, commerce, and what is usually denominated (to me seeming very ridiculously) the learned professions, I do most heartily despise that false and sickly sentimentality that concedes to any of these, in any sense whatever, any superiority to the noble profession of agriculture, in which is embraced all that is meant by the science of horticulture. Talk about science, the arts and learning! Why, here is a field of art, of science and of learning comparatively unexplored, even in this nineteenth century, broad enough, deep enough and high enough, surely, to satisfy the most laudable and exalted ambition to excel in the highest and holiest walks of human life.

The honest and industrious farmer, who is, in many respects, sensible, prudent and thoughtful, desires that his young son should have better advantages than he himself ever possessed. His son should be fitted by education for something better than the drudgery of a plain farmer. In his imagination he selects for him the occupation of a merchant, or it may be that, in his view, he should have a higher position—that of M.D., or of LL.D., or it may be of D.D. This point settled, forthwith he begins to lay his plans for the accomplishment of his object, not perceiving that he has started wrong. Yes, I say wrong, and in many ten thousands of instances fatally wrong. Hence we see the mercantile pursuit over-crowded—over-crowded by a class unsuited by native capacity for the business; hence the many wrecks and failures in that department, with all their attendant demoralization and crime. But what shall we say of the so-called learned professions? Are they not also over-crowded, and with many not capacitated for them? and while they are unfitted for the position they have been so unwisely forced into, for that very reason they are now fitted for nothing else. They fail, disgrace the profession, and demoralization, crime and wretchedness is the result. Have we not all seen this? Is it not common? And still, what multitudes are persisting in the same course! What fatuity! But it is said that he who points out an error should also be able to show a remedy. While I acknowledge the justice of the requirement, I also confess that the latter is generally the difficult side of the question. In this instance, however, I shall make the attempt to comply with the rule. In the first place, I would endeavor to impress upon the mind of the honest farmer the superior and exalted nature of his calling over all others; then, if possible, disabuse his mind of that too common and perniciously fatal error, that but little education is necessary for a farmer. If successful in this, I would urge him to educate his son with a view to this pursuit. I would urge a thorough education for a practical agriculturist. Having accomplished this as far as practicable, then, if his son had not the taste, inclination or capacity to be an agriculturist or horticulturist, let him then choose something for himself more congenial.

I might add something by way of suggestion as to the manner and

scope of his education. First, the manner, keeping in view his threefold nature—physical, moral and intellectual. Commence early, and pursue the object diligently and perseveringly. The moral culture should commence very early and under the paternal roof, with all the available aids at command, but especially the Book of books.

The physical training should be conducted in the garden, nursery, the orchard and the field, and should be very thorough in each department; relaxing and resuming, of course, as circumstances and occasions may require. The intellectual, after a suitable preparation under the parental roof, and in the village or district school, should be conducted in the very best schools the county affords. As to the scope to be embraced, I would insist that the mind be well disciplined in the mathematics and the classical languages, at least in that of the Latin; for a familiarity with this will be highly important when he comes to the more important studies of his profession. I would not have it understood, however, that there was to be any limit here as to the study of the languages, except as to the means of the parent, or the capacity of the pupil, for his education is only just commenced. I have spoken of these only as indispensable prerequisites to entering upon the study of the noble profession of agriculture. These even would be requisite for any of the other honorable pursuits of life. The agriculturist ought to be a natural philosopher. He ought to be familiar with natural history; in fact, all the natural and physical sciences—at least, such as geology, chemistry, botany, entomology and ornithology. Mechanics and architecture should not be neglected; neither meterology nor astronomy. In short, whatever is rudimentally necessary to any other, and indeed I may say to al other honorable pursuits of life, is necessary to the agriculturist. Many will, doubtless, say that I have fixed the standard very high—too high entirely for the mass of mankind. In reply, I would say that I am not of those who believe that a young man finishes his education in the school, college or university, nor yet in early or middle life, unless he should die before that period arrives. To my mind the idea that a man has finished his education while he is yet in good health and in the possession of all his faculties is an absurdity. He may learn, and should continue to learn as long as he lives. And having laid the foundation deep and broad, as I have endeavored to suggest, in early life, for a noble superstructure, he may continue to build, finish, furnish and embellish apartment after apartment to a good old age, when the whole will have been completed, and he leaves this world with the consolatory reflection that it is better for his having lived in it.

But I intended to notice some of the obstacles in the way of the healthy development of horticulture; and probably the first in importance is the want of a proper appreciation of its just merits and great utility. I can conceive of no better remedy for this than education. Ignorance and prejudice must be forced to give way to the

light of science and knowledge. We must adopt some measure to arrest the attention and arouse the mind of our people to reflection and action. And what motive shall we place before it? One suggests itself—interest—self-interest; not the most laudable, I admit, but perhaps the most available for the purpose at present, and it may be that we can direct it to nobler purposes hereafter. The pursuit of horticulture ought to be profitable, and why should it not be? All the people love the beautiful flowers, the delicious fruits and the wholesome vegetables, and the many who cannot produce for themselves are willing to pay remunerative prices to those who have them to sell. Our climate and soil are well adapted to their culture and production in almost endless variety. We have here a large and rapidly growing city. The wants of her vast population afford a ready market for these productions. The supply is not at present, nor is it likely soon to be, commensurate with the rapidly increasing demand. But there is another obstacle, and a great one, too, and equally oppressive on the producer and the consumer: that is the want of better and cheaper facilities for marketing from a distance beyond the convenient reach of the horse and wagon. Why, interjects one, have we not railroads? I admit we have them, and have them, too, at a vast cost to ourselves, both as voluntary and involuntary tax-payers. But we cannot use them as facilities for marketing purposes even by accepting the poor accommodations they offer us, without giving them the lion's share. For illustration I will detail one instance in my own case, which occurred recently: I live thirty-two miles from the city, on the Pacific railroad. I made a contract with a vegetable dealer in the city to furnish him a lot of turnips at $1 25 per barrel; he to furnish barrels to put them in, and I to pay the freight on the empty barrels from the city out to my place, and also back to the city after they were filled. He sent me 165 barrels. I filled them with turnips, and sent them back to him. Now, what would you suppose ought to have been my freight bill? I will tell you. He first sent me 100 empty barrels, one ton, on which I was charged the very modest sum of $13 75; then 65 barrels, on which I was charged $9, making $22 75, or about 67 cts. per cwt., on the empty barrels out. Then, on the 165 barrels back again, after being filled, $50 50, or 18 cts. per cwt., making in all $73 25 for 165 barrels of turnips freighted 32 miles. Now, deduct this freight bill from the amount of my sale, and I have about 27 cts. per bushel for my turnips. And then add the cost of the barrels and the profits of the dealer to the original cost of the turnips, and they cost the consumer at least 60 cts. per bushel. I enter into this minute detail of facts, in this particular instance, only to show how this system operates on both consumer and producer.

Now let us look a little into this system of enormous extortion. A few years ago, when these railroad companies were figuring up their estimates on the cost of their roads, and their probable income from them when completed, it was stated by them as a fact, founded on

actual experiment on other roads, that a freight tariff of one cent per ton per mile would be ample remuneration, paying a handsome profit on the investment. Now, let us try them by their own testimony. Then, 1 cent per ton per mile, say for thirty miles, 30 cents. But what are the facts? We find by a little figuring that their lowest rates, for heavy freight, including grain in sacks, flour, meal, apples and potatoes, is actually 12 cts. per ton per mile, or $3 60 per ton for thirty miles, instead of 30 cts., or 1100 per cent. added to what, according to their own showing, offered a handsome profit on their investment. But this is not all. The above example is taken from their lowest rates—their third class rates. From this they run up as high as 67 cts. per cwt. for 30 miles, as we have seen in the case of the empty barrels (this is what they call double first class, or special rates), or about $13 25 per ton for 30 miles, instead of 30 cts. But let us take the average between these two extremes, and we have $8 40 per ton for 30 miles, or a fraction over 2700 per cent. added to what, according to their own showing, would be a handsome profit. Let us try their scale on the article of fuel—an article of prime necessity to the inhabitants of the city. A car load of wood (about six cords) is estimated at ten tons. On this the city consumer must pay the company $13 50, instead of $3 according to their estimate of what would be a fair remuneration. Ten dollars extra on a single carload of wood! Now, is not this intolerable? especially by the tax-paying citizens of St. Louis city and county, who have been so enormously taxed to build this road, and to pay fat salaries to its officers, and who are compelled to bequeath to their children, as a legacy, their very large portion of the ponderous state debt incurred by these railroads. Is there no remedy for this? It has the appearance of a studied design to oppress the people of this city and county. Or it may be only the grateful return for the generous sacrifices we have made to sustain this company in the possession of this road; for the fact cannot be disguised that but for our liberality—to a great extent forced, I admit—it would have necessarily have changed hands long ago.

Is it any wonder that there is so much waste and wild land along the line of this road in St. Louis county, that ought to be covered with orchards, vineyards and other fruits? What sensible man would invest his money in lands and improvements on the line of a railroad under such disadvantages? How long are we to endure this system of legalized oppression and extortion? It does seem to me that forbearance, in this case, has long ceased to be a virtue. I appeal to you, as an influential body of agriculturists and horticulturists, to at once take this subject under consideration. The great interests of our profession and calling demand it; the interests of the people and of our common humanity demand it. If legislation is necessary, where can it originate with a better prospect of success than in this body of experienced, intelligent and influential men? Let it be remembered, that from the very inception of the system of railroad

legislation in this state, that the advantages have all been on the side of these companies, and without sufficient guarantees on the side of the people. If it is to go on at this rate, how long will it be before they will have entire political control of the state? And then, woe be unto the political aspirant who is not a supple instrument in the hands of these soulless corporations.

Let us remember the history of the old United States bank, and take warning, lest ere we aware the power of self-government is wrested from the hands of the people.

Rev. Chas. Peabody: I intend offering a resolution, prefacing it with the remark that when I first attended these meetings we were graced with ladies and flowers. I remember the fine essay by Wm. Sanders and magnificent bouquet by Mr. Homeyer, and regret not seeing either ladies or flowers at this meeting. I wish to move that the president be instructed to endeavor to procure a building of sufficient size for the accommodation of ladies and for the exhibition of flowers. Adopted.

The business committee presented the following closing resolutions, which were adopted:

Resolved, That the thanks of this society are due, and are hereby tendered to the Rev. Chas. Peabody, Rev. J. J. Colman, and Mr. T. R. Allen, for their kindness in opening our deliberations by prayer.

Resolved, That the thanks of this society are due, and are hereby tendered to the justices of the county court for their kindness in granting us the use of the supreme court room free of charge.

Resolved, That the thanks of this society are due, and are hereby tendered to Capt. James Quigley, the kind and attentive janitor of the court house, for attentions during the meeting.

Resolved, That we tender our warmest thanks to the proprietors of the Planters' house, Everett house, and Olive street hotel, for their kindness to our delegates from abroad, by entertaining them at reduced prices, thereby showing their appreciation of the labors of those engaged in developing the resources of the great west.

Resolved, That the thanks of the society be tendered to the Iron Mountain, North Missouri, and Pacific railroads of Missouri, and to the Terre Haute, Alton and St. Louis, and the Chicago and Alton railroads of Illinois, for returning our members free of charge.

Resolved, That the thanks of this society are tendered to Mr. Curtis for the use of plates and dishes for the exhibition of fruits at this meeting.

Resolved, That the thanks of the society are hereby tendered to the reporters for the press of the city for the large share of their time and space allotted to the business of this meeting.

By Mr. T. Allen:

Resolved, That the deep interest manifested by the uniform attention to whatever pertains to agricultural progress, and for the full and excellent reports of our proceedings, given on every occasion by

the Democrat, calls for the especial notice and thanks of this society.

By J. M. Jordan:

Resolved, That the thanks of this society are hereby tendered to the St. Louis Times for reporting our proceedings in its columns, thereby showing their appreciation of our labors.

Resolved, That we pay $10 to the attendant of this room for labor and attendance during the session, and for putting the room in order after our adjournment.

Resolved, That the secretary is hereby instructed to draw a warrant on the treasurer for the sum of $45 70, expended for this meeting as per bill of sundries.

REPORT OF THE COMMITTEE TO VISIT THE WINE HOUSE OF THE AMERICAN WINE COMPANY.

The committee appointed to report on the visit of the Missouri state horticultural society to the wine house of the American wine company, present the following report:

The society, on the invitation of Mr. Isaac Cook, president of the company, visited the company's wine house, where they were received by Dr. J. H. Scholer, superintendent of the establishment, and were by him and Mr. Cook politely conducted through the house and spacious wine vaults, some filled with immense casks of wine of the last and previous year's vintage; others with extended racks of their fine sparkling wine, with which the members present were bountifully regaled; and after several short speeches by members of the society, expressive of their gratification in witnessing the extensive and well adapted arrangements for wine making, which called forth appropriate remarks from Mr. Cook and Mr. Wm. Glasgow, the pioneer in the manufacture of sparkling wine in Missouri, the members returned, and your committee believe they express the sentiment of all who were present when they say, not only were they highly gratified with their visit to this extensive establishment, but convinced of its complete adaptation to the purposes designed, and that it is an institution of which our state may well be proud; for what they have already done gives the best assurance of their capacity not only to sustain the character of Missouri wine, but to do their fullest share in elevating it to the highest standard which the adaptation of our state to grape culture renders it so eminently susceptible of.

As this is the pioneer institution west of the Mississippi, and we believe, as yet, the only one in which sparkling wine has been produced, it may not be inappropriate to give a brief history of its origin and progress.

We learn that the manufacture of sparkling wine was commenced in St. Louis in 1854, by Wm. Glasgow, Jr., Amede Valle and Allen Glasby, under the superintendence of Wm. Desterick.

In 1856 the Missouri wine company was formed, the above parties being the largest share-holders, when the establishment was greatly

enlarged and the business increased. It continued till 1860, when in consequence of the death of the superintendent, it was brought to a close.

The American wine company was organized in Chicago in 1859. After remaining in operation about a year, and finding that Missouri offered greater facilities, both for grape growing and the manufacture of wine, the company moved to St. Louis and opened its headquarters there.

After buying out the works, cellars, buildings, etc., of the old Missouri wine company, they determined to engage in the manufacture of sparkling wine on a much larger scale, besides paying the same attention to still wines and brandies.

The company have since enlarged their house and cellars, having now five spacious cellars, one of which, thirty-five feet below the surface, is excavated from the solid rock, giving them unsurpassed facilities for the manufacture of American wine, having a capacity for making one hundred thousand gallons of wine, and from two to three hundred thousand bottles of sparkling wine per annum.

As the company express their decided preference for Missouri grapes over any others they have been able to get, they will no doubt make large drafts on the rapidly extending vineyards of our state; and doubtless it will be to the advantage of those who have not the proper appliances and skill for wine making, to meet the demand, rather than risk the making of an inferior wine that will be unsalable; for an establishment possessed of every appliance which the experience of ages can suggest, and capital can procure, and where the main processes through which grape juice must pass in making wine (in any one of which it is liable to damage that no after treatment can fully repair) are conducted with the utmost attainable skill, and watched with the most vigilant and undivided attention, must possess advantages which the grape grower, with imperfect appliances, limited experience, and divided attention, cannot hope to compete with.

We therefore conclude that while grape growing and wine making have a common interest and mutual dependence, they must become separate pursuits, if we would hope for the best success; and the sooner that fact is appreciated and acted upon, the better for the parties concerned, for the perfection of our wines, and for the public good.

Al of which is respectfully submitted.

(Signed) H. CLAGETT,

Chairman of the committee.

The committee on agricultural colleges presented a report which was amended and finally adopted (as before inserted.)

This report gave rise to considerable discussion, but as all that was said had been said in a similar form in the morning, and the numerous items attending the close of the meeting crowded on the attention, it is omitted.

A fine sample of blackberry wine, sent by Mrs. Crawford, Eureka, but arrived too late for the action of the committee of the whole (who could get any), after which the meeting adjourned sine die.

The president appointed the following committes for 1867:

STANDING COMMITTEES.

Business committee—Rev. Charles Peabody, S. M. Bayles, E. R. Mason, Oliver Quinette, and Carew Sanders.

On entomology—Dr. E. S. Hull, Prof. G. C. Swallow, Dr. C. W. Spalding, William Muir, and J. H. Tice.

On flowers—Carew Sanders, William D'Oench, C. M. Saxton, Dr. B. F. Long, and Charles Conon.

On vineyards—George Husmann, W. C. Flagg, T. U. Guye, Dr. L. D. Morse, S. F. Tafft (of Marion county), J. L. Stephens (of Cooper county), and A. H. Vories (of Buchanan county.)

On orchards—O. H. P. Lear (of Marion county), D. W. Bryant (of Jefferson county), O. A. A. Gardner (of Audrain county), B. W. Davis (of St. Clair county, Illinois), and J. A. Pettingill (of Macoupin county Illinois.)

SPECIAL COMMITTEES.

Committee to increase membership—J. P. Helfenstein, J. M. Jordan, Isidor Bush, William T. Essex, Dr. H. Clagett, and R. S. Elliott.

To correct the lists of American pomological society to suit Missouri apples—J. J. Kelly, S. F. Tafft, and William Pœschel.

Pears—John H. Tice, B. Smith, and C. T. Mallinckrodt.

Cherries—Carew Sanders, J. H. Paddleford, and L. D. Votaw.

Nectarines, apricots, plums and quinces—William Muir, O. H. P. Lear, and Charles Conon.

Native grapes—George Husmann, Dr. H. Clagett, and E. R. Mason.

Foreign grapes—William Glasgow, C. H. Haven, and Henry Michel.

Strawberries—S. M. Bayles, R. S. Elliott, and O. Quinette.

Blackberries, raspberries, currants and gooseberries—J. M. Jordan, T. W. Guye, and John T. Walter.

The fruit committees should report to the recording secretary by the first week of August, that he may have time to arrange the same for the meeting on the 11th September.

Committee of arrangement for meeting of American pomological society—N. J. Colman, C. W. Spalding, W. P. Fenn, Josiah Fogg, J. P. Helfenstein, Wm. D'Oench, William T. Essex, C. M. Elleard, and R. S. Elliott.

Gallizing—W. C. Fagg, George Husmann, Dr. E. S. Hull, Dr. L. D. Morse, and C. W. Spalding.

Fruit packages—Dr. H. Clagett, Messrs. E. A. Riehl, L. D. Votaw, George Booth, and George Husmann.

Collation of by-laws—Rev. Charles Peabody, Dr. L. D. Morse, and C. M. Saxton.

OFFICERS OF THE ASSOCIATION,

1866.

ARTHUR B. BARRET, *President.*
BENJAMIN O'FALLON, *Vice President.*
J. O'F. FARRAR, " "
A. PHILLIPS, " "
DANIEL G. TAYLOR, *Treasurer.*
G. O. KALB, *Secretary.*
P. McANDREWS, *Sup't of the Ground.*

DIRECTORS.

ARTHUR B. BARRET,	N. J. COLMAN,
WM. L. EWING,	WM. M. McPHERSON,
G. B. ALLEN,	A. PHILLIPS,
DANIEL G. TAYLOR,	E. A. MANNY,
BENJAMIN O'FALLON,	BEN. SANFORD,
J. O'F. FARRAR,	JEFF. K. CLARK,

FRANCIS WHITTAKER.

PREFACE.

In this, the first report of the agricultural and mechanical association after an interval of five years, during which time no exhibitions have been had, owing to the distressful civil war that has raged in the country, the author has endeavored to mete out impartial justice, and to speak of things as they actually occurred under his personal observation.

How creditable the report is, how and in what manner it falls short of the important event—for important it is, both to the citizen generally and to the parties interested in particular—he is unable to decide.

To describe all in the various branches that was of interest, or that is important and useful, represented at this exhibition, and to do it in a proper manner, is a difficult task, and is hardly to be accomplished by one person, or in a volume of the present size.

Here have been gathered together numerous works in the arts and manufactures; the various products of the soil; the best and most improved stock raised upon American soil, or imported from foreign countries; the varied implements used in agriculture, and the improvements made in the most complicated machinery—all that the genius of man is able to produce or invent for the purposes indicated.

The award of merit in the departments have been made by competent men, selected from our citizens for their admitted skill and knowledge in the several branches they represent, and it is the duty of the author to compile and arrange their decisions in an attractive and agreeable form, with such suggestions as his judgment may dictate; the labor requisite for the former, the author is conscious that he has performed—the ability and versatility of talents requisite for the latter, he is not sure he has possessed. Eor any short-comings in this particular, he begs the reader's kind indulgence.

He commends the president and directors for their unwearied exertions—for the time, labor and expense they have bestowed, gratuitously, on this great utilitarian scheme, and congratulates them upon the success of the great fair of 1866, unparalleled by any of its predecessors, unequaled in excellence by any of the many and great exhibitions that have been holden the present year throughout the Union. In the name of the cause they have the honor to represent, he congratulates and thanks them, and so doing, feels that he but echoes the general sentiment of the community, who, one and all, have either been gratified, amused, instructed, or "materially" benefited by their exertions.

DIRECTORS

OF THE

ST. LOUIS AGRICULTURAL AND MECHANICAL ASSOCIATION,

SINCE ITS COMMENCEMENT.

FIRST ANNUAL FAIR—Directors for 1856.

Hon. J. R. BARRET,
Gen. THORNTON GRIMSLEY,
Capt. ANDREW HARPER,
Maj. H. S. TURNER,
H. C. HART,
T. T. JANUARY,
C. L. HUNT,
NORMAN J. COLMAN,
JOHN WITHNELL,
JOHN M. CHAMBERS,
JAMES M. HUGHES,
F. DINGS,

HENRY T. BLOW.

SECOND ANNUAL FAIR—Directors for 1857.

Hon. J. R. BARRET,
Gen. THORNTON GRIMSLEY,
Capt. ANDREW HARPER,
HENRY C. HART,
HENRY S. TURNER,
T. T. JANUARY,
JOHN WITHNELL,
CHARLES L. HUNT,
HENRY T. BLOW,
F. DINGS,
JOHN HARTNETT,
THOMAS B. GRAHAM,

JOHN M. CHAMBERS.

THIRD ANNUAL FAIR—Directors for 1858.

Hon. J. R. BARRET,
THORNTON GRIMSLEY,
HENRY T. BLOW,
CHARLES L. HUNT,
CHARLES TODD,
BENJAMIN O'FALLON,
ANDREW HARPER,
HENRY C. HART,
T. T. JANUARY,
JOHN WITHNELL,
THOMAS B. HUDSON,
JOHN SAPPINGTON,

HENRY S. TURNER.

FOURTH ANNUAL FAIR—Directors for 1859.

Hon. J. R. BARRET,
CHARLES TODD,
CHARLES L. HUNT,
HENRY T. BLOW,
HENRY S. TURNER,
NORMAN J. COLMAN,
JOHN SAPPINGTON,
BENJAMIN O'FALL'IN,
WILLIAM L. EWING,
G. B. ALLEN,
JOHN O'F. FARRAR,
WILLIAM LINDSAY,

WILLIAM G. CLARK.

FIFTH ANNUAL FAIR—Directors for 1860.

ANDREW HARPER,
CHARLES L. HUNT,
CHARLES TODD,
THORNTON GRIMSLEY,
G. B. ALLEN,
JOHN O'F. FARRAR,
BENJAMIN O'FALLON,
WILLIAM L. EWING,
WILLIAM LINDSAY,
WILLIAM M. McPHERSON,
NORMAN J. COLMAN,
JOHN SAPPINGTON,

DANIEL G. TAYLOR.

INTRODUCTION.

It is the last week of September, 1866. The great agricultural and mechanical association is to open on the following Monday, the 1st day of October.

The same week, the great southern relief fair is to be holden; and the succeeding week, the Laclede race course, the most splendidly arranged grounds on the continent, are to be inaugurated.

The internecine war that had deluged our country in fraternal blood was happily concluded. The "cordon" of soldiers that had been stretched around St. Louis for upward of four years—much to the detriment of her trade, which, in consequence, had been diverted into other channels—were withdrawn.

Every eye had for some time been directed to St. Louis. Her unrivaled location, in the center of the Mississippi valley, standing sentinel, as it were, on the very banks of the father of waters, and at the mouths of the Missouri, Illinois and the Ohio rivers, called forth the wildest speculations of fancy as to her future magnitude and importance.

Her rapid increase in population—1000 inhabitants at her first occupation in the year 1804, 2000 in 1816, 4600 in 1820, and upward of 200,000 to-day—is the wonder of the age; while the wealth derived from her foreign and domestic commercial advantages is solid, substantial and real, and in the hands of home capitalists.

All see that St. Louis has grown to her present size without the artificial aids of either railroads or canals. All see that the former are now being distributed to every part of the country, which, like so many veins in the natural body, will collect rich materials to be drawn to St. Louis—the heart of the nation—from thence to be distributed through every artery of the world's commerce.

With every material at her very portals to feed a population of untold millions; with every raw material within easy reach, what is to prevent St. Louis—opulent, enlarged and still increasing St. Louis—to become the glory of the earth?

Time, population, cheapened labor, increased capital and manufactories will certainly accomplish it. St. Louis must become the most populous city of the world.

When Russia shall have completed her steady march southward along the Crimea; when England shall have lost her eastern possessions; when the China trade is turned across this continent; when empire shall have taken her final leap westward; when the navigation

of the Mississippi shall be much improved, as it certainly will be; when a canal shall be opened to the lakes; when canals shall be dug in various other directions, will not St. Louis become the first city of America as to the number of inhabitants, and may she not, also, hold the first rank as to opulence? May she not carry on every trade? may she not manufacture every article of utility or luxury that every other place is noted for? Will not her operations, on account of her facilities for commerce, be on the most extensive scale?

Will not such a spirit of competition spring up among her industrious and enterprising inhabitants, that whatever speculation in art, manufactures or commerce, which gives fair promise for the advantageous employment of capital or talent, be sure to be embarked in and prosecuted with the most unremitting energy?

Imagination cannot conceive, nor pen picture, the future destiny of St. Louis.

We have seen how steadily St. Louis has advanced. We have noticed the impediments the war threw in her pathway; that goods could neither be got into nor from her with facility; that her vast southern trade was entirely cut off during the progress of that war.

The war ended, peace restored and confidence regained, we have still to record another calamity—it was the cholera—which raged so fearfully during the past summer. Fearful as were its ravages, terrible as were its consequences, it yet affords another proof of the wonderful vitality of St. Louis; another proof that nothing can impede her progress—which, through war and fire (for the great fire, in 1849, destroyed $5,000,000 worth of property) and pestilence—her march is still onward! onward!!

One to witness the vast crowds that were thronging the streets, would never have dreamed that a great scourge had so recently visited the city.

All the hotels were over-run with visitors. A look into the Lindell or Southern hotels in the evening was animating indeed. Their gorgeous apartments, all ablaze with gas lights, filled with visitors seeking the various diversions about to be presented, produced a "coup d'eil" at once startling and beautiful.

The great majority of these strangers had been attracted by the great fair, which may fairly challenge comparison with anything of the kind the world has yet seen for the variety of its purposes and the utility of its design. Lofty and praiseworthy in the interests it represents, varied and powerful in its ability for good, it forms a landmark to which every eye instinctively turns. It teaches truths higher than those of the multiplication or interest table. It tells of tastes and enjoyments that do not require wealth for their gratification. Its mission is not for an age, but for all time. It is not a toy to be used for a day and then thrown aside, but to remain a permanent addition to the means of amusement and instruction to be possessed by St. Louis and the whole country. Its attractions are ever varying—it

presents what is curious in art or beautiful in nature. It is the receptacle of every new invention; the patron of the constructive intellect of the country. It marks the result of the gradual improvements of science; it rewards every victory which man wins from the hidden and reluctant laws of nature. Its noble destiny is to be the treasure house of the spoils which the human intellect shall bear off as trophies of its victories in the field of knowledge.

What more glorious or appropriate part can be performed by an association? The former fairs have accomplished many beneficial results, and have enabled us to form some guess, but no complete or adequate conception, of what they may do for the future.

HISTORY

OF THE

ST. LOUIS AGRICULTURAL AND MECHANICAL ASSOCIATION.

In the year 1855 a party of enlightened and far-seeing men, considering the vast extent of the Mississippi valley; the fertility of its soil; the vast number of freighted keels that were plying its numerous rivers; the mines of wealth that were slumbering untouched in Missouri soil; the many streams that were bearing upon their bosoms all that is necessary for the comfort or civilization of mankind to the very portals of St. Louis; that she was the true central point of the Union; that she was adjacent to the greatest graneries of the world; that she would soon become the center of the greatest agricultural and mechanical interests of the world; that inland commerce is nineteen times greater than external commerce; that some concerted plan of action would best foster and encourage and more rapidly bring forth Missouri's resources—formed the above named association which has already so successfully answered their expectations, in giving new and additional momentum and vitality to those interests it was designed to promote; which has already become of such vast extent and has already called forth an immensity of national wealth; which has roused the latent fires of ambition in the farmers, and is revolutionizing the old system of tilling the earth; which has become the theater of so many grand and interesting scenes, and which has recently become to be cherished as one of St. Louis' most darling enterprises.

They wished to establish a place to exhibit the various products of the generous soil of the valley, which vies in richness with the famed delta of the Nile; to collect together in one place the varied and extensive applications of steam by which labor might be cheapened; to develop a city where numerous manufactories must eventually arise; to encourage agriculture and cheapen the prices of living; to promote commerce and the mechanical interests; to improve the breeds of horses, sheep, cattle and all other kinds of stock; to lend a helping hand to art in all her sinuous and diversified enterprises; to form one common meeting place, where the inhabitants of the valley, like one great family, might exchange courtesies and give and take information from each other; to assist in the extension of popular knowledge in he application of science to art; to show to the people how many

allies and auxiliaries to aid them are being found out every day in the powers of nature, and in the inventions of mechanism.

Such were the designs, such the cherished hopes of the originators and promoters of the agricultural and mechanical association. They were men of wealth, of integrity, and of tried business qualifications. They considered that they had a goodly trust to perform, and in the strength of that goodly trust they organized the association, which has proved rich in blessings to the community, even richer than they, in their fondest dreams of its success, ever dared to anticipate.

A charter was obtained December, 1855; the citizens, persuaded of the utilitarian nature of the enterprise, void of all desire for gain, quickly filled the subscription lists for the capital stock.

A good work was accomplished—a work, we might say, whose influences will still be felt when empires shall have been wrecked, when the dynasties of our republic shall have become changed, when monumental piles and triumphal arches shall have crumbled into dust; a work fraught with untold blessings to the present generation, and whose genial influences shall yet speak as with a voice from heaven to enlighten generations to come; a work which will embalm the memory of its founders in the hearts of grateful posterity. Officers were appointed May 5, 1856. They were J. Richard Barret, president; T. Grimsley, A. Harper and H. C. Hart, vice presidents; H. S. Turner, treasurer; G. O. Kalb, agent and recording secretary, and Oscar W. Collett, corresponding secretary.

When the directory were divided as to a suitable location for the fair, and it seemed impossible to satisfy the parties interested—for meeting after meeting broke up without being able to settle the matter—when all seemed inextricable confusion, Colonel John O'Fallon, now no more, but still alive in the memory of our citizens for his many acts of disinterested patriotism; for his many and noble acts of generosity, both public and private; for his comprehensive intellect; for his eagerness to advance any enterprise looking to the welfare and prosperity of St. Louis—offered to sell the association, on reasonable terms, the required amount of property, in a suitable location. It is the site of the present fair grounds—a location of great natural beauty. Its virgin soil had never been molested with the plowshare, nor its primeval forest touched by the edge of the ax.

Other obstacles appeared, but the president, especially, pushed on with nerve, resolution and unexampled success. He, with the directors at his side, surmounted hill after hill of difficulty, and despaired not of reaching the bright summit of success, though that goal was yet distant and elevated.

Suitable buildings were erected in the midst of the wild forest, and other improvements were made. The grounds began to smile, and promised what a distant day would bring forth.

In the fall of 1856 the first fair was held. The premium list amounted to $10,000. It was a decided success, and all were more

than satisfied. All misgivings now brightened into certain assurances. The grounds were still further beautified and adorned; buildings for the accommodation of guests and exhibitors were augmented in number. The premium list for the next fair, that of 1857, amounted to $16,000. Warmed and enlivened by the noble purposes of the enterprise, all classes gave their aid with bravery and energy—an enterprise just such as was wanted in a land of freedom, peace and plenty; an enterprise which stimulated every industrial pursuit, and every noble and virtuous impulse. Crowds flocked to it from our own and the adjacent states; city people, with smooth manners and gaudy and splendid equipages; farmers, mechanics and artisans, with strength, firmness, expansion and dignity of soul, which the good cause inspired, were all there. They came from the north, south, east and west. The great St. Louis fair was already established as one of the permanent institutions of the country.

Records of the fairs of 1858, 1859 and 1860 have been published. Their success was unparalleled. Every novel and useful invention, every celebrated horse from the north to the south—Lexington, Leviathan, Ethan Allen, Flora Temple, the descendants of Justin Morgan and Black Hawk; sheep from Canada and Spain; draught horses from France; jacks from Malta; chickens from Asia; geese from Africa; goats from Persia, had all been exhibited there; and even the Prince of Wales had honored the great fair with his visit. He had beheld, in miniature, the mighty resources of the west, her great advance in commerce and manufactories. He here saw descendants of the hardy pioneer who had subdued the forest and wild beasts; the children of those intrepid men who had, with disgust, aversion and abhorrence, turned away from the exactions of his country little less than a century ago; he saw the western yeomanry, who will never permit themselves to be trampled on with impunity; he saw these same people, so jealous of their rights, so undaunted in war, industrious in peace.

J. Richard Barret had presided over all the fairs up to 1860, had never for a moment flagged in personal exertion or in expenditure to perfect them in usefulness, nor to highly embellish the spot to which nature had been so prodigal in her gifts. To his personal efforts and labors much credit is due. He had been chosen representative in congress from the district embracing St. Louis, and was no longer a candidate for re-election. Andrew Harper, one of the first incorporators, a noble and public spirited gentleman, since deceased, was chosen to succeed him. Under his management, also, the fair met with unprecedented success, and it merited and received the highest encomiums and commendations of praise. An excellent report of which fair, having been given by M. Hopewell, M. D., makes it unnecessary here to say more concerning it.

This was the last fair the grounds were destined to witness till the one of which this is the record.

The black cloud of party zeal and party rage, and sectional fanati-

cism, that for sometime overhung our happy country with threatening aspect, now broke forth in most violent paroxysms. Peace was frightened away from these very grounds prepared for her habitation.

Frowning Mars rushed in to take possession of her household gods. Bayonets, swords, epaulettes and artillery glittered in the very precincts of the amphitheatre; the ground resounded with tread of armed battalions; a chain of sentinels marched to and fro on every side; thousands of white tents dotted the plain; it was the paraphernalia of grim-visaged war; but the stars and stripes, dishonored in some parts of our country, still waved in triumph from the lofty pinnacle of the pagoda.

Missouri, at first meditating the fratricidal murder of the Union, now returned to her duty, and repented of her ruthless and unnatural design. Men of sagacity, wisdom, integrity and courage, unawed by portentous menaces, had rallied, and taken their stand upon these grounds. They would die if need be, but the flag should not be humbled, scourged, desecrated by rebel hands, nor the state desolated and ruined by secession hordes.

These grounds remained an encampment during the war, and when no longer blows were aimed at this goodly form of government; when the states were again united; when the bond of union remained unbroken; when our chief good and our chief honor had been saved, they were returned, unsullied and uninjured, more beautiful than ever, into the hands of the association.

The next president of the association was Charles Todd, a gentleman who had belonged to it from its first incipiency, and had never once faltered in his zeal to promote its interest. His administration, however, being the period in which the war raged, no fairs were held. His management was prudent and salutary, and by it the best interests of the association were advanced.

To him succeeded Arthur B. Barret. The long and dreary night that had enveloped industrial pursuits had cleared away. The cherub peace looked down from the bright heavens upon the earth, whose kindly breast no foolish passions can dry up—her limitless bounty survived, and industry, though crippled, was not destroyed. Plenty had come again, peace was re-established, and confidence was regained.

Mr. Barret, the cousin of the first president by that name, labored assiduously; with unyielding energy and devotion he applied himself to the good cause. There was much to be done. The entire grounds and buildings required to be refitted or rearranged; the fountains and other ornamental appurtenances had been neglected, and in some instances had to be rebuilt; the grounds were dilapidated, and did not present that neat aspect necessary for an exhibition; everything had suffered by neglect, save the trees and shrubbery, which were much grown during the time; the enthusiasm among the people had to be re-enkindled. How nobly, faithfully and successfully he performed the task assigned him, the unparalleled success of the fair of

1866 will attest, which success is in no small degree owing to his untiring exertions.

During the fair week, the directors of the association assembled in their private room, and, amid festivities and other appropriate ceremonies, presented Mr. Charles Todd, who had been president during the interregnum occasioned by the war, with a watch, which bears the following inscription, which explains itself:

"Presented to Charles Todd, Esq., by the agricultural and mechanical association of St. Louis, in appreciation of his zeal and ability displayed as its president."

Mr. Gerard B. Allen made the presentation speech, which is as follows:

SPEECH OF MR. G. B. ALLEN.

MR. CHARLES TODD: Preserving a lively and grateful recollection of the zeal and ability displayed by you during the five years you were its president, the agricultural and mechanical association of St. Louis has assigned to me the pleasing task of presenting to you, in its name, this testimonial of its appreciation of your valuable services.

Connected as you were with this body from its first organization up to the time of your removal to another city, actively engaged in building it up to its present state of prosperity, devoting your time and talent in furtherance of its success, it must be to you, who have watched its interests with such jealous care, a gratifying reflection that, although years have elapsed since the last exhibition was held on this spot, and many important changes have taken place in our community, and many of the early and ardent friends of this association are sleeping the sleep that knows no waking, yet the assembled thousands of fair women and gallant men who grace this place with their presence each day of this week, prove conclusively not only the stability of the enterprise you were so instrumental in bringing into a vigorous existence, but also its adaptation to a great popular want.

The approving sanction of those with whom we are accustomed to act furnishes, perhaps, the most exalted satisfaction we are permitted to enjoy. In your case, sir, coming, as this approval does, from those who have been intimately connected with you in social, official and business relations for the past twenty-five years, it has far more than ordinary import, for it may be said to combine an approval of your long career in this city, as a high-toned, generous and honorable man, as well as a public-spirited and enterprising citizen.

In the name, then, of the agricultural and mechanical association of St. Louis, I present you with this testimonial of regard. Its truth and fidelity are emblematic of those manly types of character you have ever exhibited in your intercourse and dealings with your fellow citizens.

MR. TODD'S RESPONSE.

I accept with pleasure this beautiful testimonial. It will remind

me of services given to an enterprise of much usefulness in the past, and which promises, with the liberal encouragement it gives to the varied industries of the country, much greater usefulness in the future. My connection with it dates from its beginning, and has continued through a period of nearly ten years. I have shared its labors and its triumphs, and hold as among the most pleasant recollections of my life the part I have taken in the well directed efforts to promote the best interests of the industrial classes.

To the gentlemen composing the board of directors of the St. Louis agricultural and mechanical association, for their very flattering recognition of my services, I am profoundly grateful.

Mr. Allen then proposed the health of Mr. Arthur Barret, the present president. Mr. Barret responded in a brief and appropriate speech, and the wine being circulated pretty freely, toasts and speeches succeeded until the company felt in a good humor, and thought it time to return to their homes.

Mr. G. O. Kalb, who has acted as secretary of the association since its incorporation, and is still acting in the same capacity, should by no means be forgotten. His labors for the past ten years have been unremitting; in the organization of the association, they were, of course herculean. His faithful attention to duty, his business qualifications, his gentlemanly deportment, his affability of manners, which have endeared him to all who have come in contact with him, and the services he has rendered entitle him to commendations of praise, and should assign him no inferior rank in the history of the association.

FINANCIAL CONDITION OF THE ASSOCIATION.

TENTH ANNUAL REPORT OF THE FINANCIAL SECRETARY OF THE ST. LOUIS AGRICULTURAL AND MECHANICAL ASSOCIATION.

To the Board of Directors and Stockholders of the Association:

GENTLEMEN: From the detailed accounts upon record you will observe that from the proceedings of last fair the amount of eighteen thousand three hundred and eighty-nine dollars was paid to the estate of Col. John O'Fallon, deceased, as balance due for the fifty acres where the present fair grounds are located.

The association stands now free of all debt, and have their beautiful grounds with all the improvements thereon, as an offset against their capital stock, which amounts to $83,000.

Besides this, for the first time since the organization, a report is laid before you in which cash on hand is reported. The association

has $11,000 on hand, of which the larger portion, however, will be necessary to be expended for improvements during this spring, to make the fair grounds that which it is intended by the stockholders that it should be, the pride of our city.

Very respectfully,

January 1, 1867. G. O. KALB, *Secretary.*

DESCRIPTION OF THE FAIR GROUNDS.

We have now arrived at the eastern or great gate of the grounds. In this, one of the loveliest mornings of autumn, all is fresh and green, the atmosphere is crystal clear, the breeze bears balmy sweetness on its wings. We catch a glimpse of the grounds, adorned with a prodigality of natural beauty; of the lawn thickly shaded with native forest trees, yet dressed in summer, which wave their tops in melodious murmurs, or from whose boughs the song of birds ascends to heaven; of the undulating plain which agreeably assimilates with all that is beautiful. We proceed down the main alley, crowned with groves on either side, whose boughs hang down their foliage in picturesque luxuriousness.

Along the winding avenue, over tracks of emerald grass, in the midst of other forest giants with their gnarled and fantastic forms tinted in the silvery hue of autumn, we catch a glimpse of a cottage blending the beauties of Gothic and Grecian architecture, devoted exclusively to the "fair" who visit the exhibition.

Through other lines of stately trees, whose tops are lit up with soft sunshine, we perceive the immense circular structure—the amphitheatre—rearing its lofty white crest above the trees toward the clouds. All presents a vivid contrast to the crowded city and the dusty streets without.

We turn to the right, and follow the broad track which leads around the grounds, nearly one mile in length; laid off for the purpose of testing the speed of horses. To the right of this track, skirting one-half of the immense inclosure, are the hundreds of stalls erected for the accommodation of any quantity of stock that may be entered for exhibition; to the left is the beautiful undulating landscape covered with stately trees, under whose shade fountains, in appropriate localities, continually play their jets of water, which feed the fish ponds, or replenish with fresh water the basin near the stall for the accommodation of stock.

Further around the track to the left, in an open, sunny space, girt

with exquisite woodland scenery, we perceive a long white building, filled with noise and bustle—it is the machinery department. Still further on, we pass the carriage entrances to our right, and the magnificent artificial lake to our left. We have now made the circuit of the inclosure.

Arrived again at the main entrance, we pass directly onward through the broad avenue, curtained with ilex and oaks and brilliant evergreen growth, to the grand amphitheatre, which stands on a gentle swell and darts its towering light visage in glowing majesty toward the dark back grounds which encompass it on all sides.

Underneath the promenade, all around this immense circular structure, are numerous booths, where refreshments of every kind are sold to visitors. Busy crowds are now revolving around it, drinking, laughing, talking, and seeking pleasures of every kind. The scene here presented—the miniature of a bustling world, where a crowd of beauty and fashion are not wanting—rivals the far-famed Epsom, Ascot, Doncaster, or New Market.

As we pass "en partierre" to the south side, around the amphitheatre, with the busy booths, like so many hives skirting our way to the right, stretching the eye southward, toward the artificial lake, we perceive that the woody landscape has been stolen away by the dense mass of horses, buggies, and other equipages, now hitched there.

Further on to our immediate left, in a shady nook of oaks and tangled evergreens, we pass the office of the secretary of the association, every window thronged with persons making their entries. In its immediate proximity, the row of little one-story white houses, at whose doors we recognize the well known faces of many of our most charitable ladies. The large black letters above the porch announce that it is the "home of the orphans and friendless." These kind ladies are doing melting charities, that soothe, and heal, and bless: they were furnishing dinners and other refreshments, the proceeds not to be applied for enriching the lordly, but to be donated for the benefit of the widows and orphans of the fallen in the south. Further on to the left we pass the floral hall, imbedded among the forest trees, and our eye wanders over the distant landscape, now all life and animation, covered with thousands of agricultural implements, all in active operation.

There, the mechanical department and the fruit hall, at whose entrance stands Herring's safes, Fairbank's scales, and other ponderous articles; among the rest, several huge bells. They were constantly tolled, and their clear voices resounded throughout the entire grounds; their solemn notes fell gently on listening ears; they seemed to say, that this bright and living scene would quickly fade, and change, and disappear; they seemed to say, that the thousands which composed this gay and happy crowd would soon be hushed in death.

"Slow and heavy hear it swell;
'Tis the solemn passing bell."

We pass on, and in the distance, over the grass plot and beyond several little cottage structures, combining the beauties of more than one style of architecture, we perceive, among the shady trees and primrosy dells, the art hall and the hall for the exhibition of miscellaneous articles. In our immediate vicinity several fountains continually send forth jets of water with the most refreshing effect, and the landscape is varied with aquariums and fish ponds.

We pass on; we linger for a moment before the gallinarium, a most chaste edifice made entirely of wire, three stories in hight, thirty feet in diameter, appropriated, as its name indicates, to the accommodation of every species of the feathered creation.

We have again arrived at the ladies' cottage, imbedded in the trees among tangled dingles and clambering wild roses. We have made the ground circuit of the amphitheatre, and have taken a bird's-eye view of the entire grounds from that standpoint. Wherever we have turned we have met a constant stream of human beings. All has been attractive, exciting, novel—in fact, we have witnessed just such a scene as the artist loves to paint and the poet to fancy.

We will now, after this hasty glance at the exterior of the grounds, visit the several departments in order, commencing with class "A," the agricultural department.

Class A.

AGRICULTURAL DEPARTMENT.

NORMAN J COLMAN, *Superintendent.*

Agriculture, the basis of a nation's wealth, the means by which the welfare of the whole country is advanced, and the implements by which labor is saved, is of immense importance.

To open the avenue to advancement and improvement in this line, is the design of this department. The excellence, the merits, the practical utility of horse powers, of cider presses, of corn shellers, of straw cutters, of cob grinders, of wheat threshers, of churns, and of every other machine conceived by the genius of man, amidst the noise and bustle occasioned by their operation, were here tested. This department was honored by a large and creditable display. Its importance was justly appreciated, and we may triumphantly ask, what people have encouraged agriculture that have not left after them imperishable monuments of greatness, and have not flourished like the spring? To say the contrary would be to abuse reason and to falsify history. The implements exhibited in this class were legion. They were generally practical; each one had merits, peculiarly its own; were interesting to behold, were useful to our farming community, and, in fact, there seemed to be one for every purpose a farmer could possibly put it to.

The majority of these mechanical devices were from other states, but Missouri was well represented; sufficiently so to persuade any one that in time, with a little encouragement, and with the fostering hand of commendation and support, she will soon rank in mechanical art among the first states of the Union.

The awards were as follows:

No. 1—FOR THE MOST IMPORTANT INVENTION RELATING TO AGRICULTURE PATENTED WITHIN THE LAST THREE YEARS, PROVIDED THE SAME BE THOUGHT WORTHY—DIPLOMA AND $20.

After due consideration of all the many useful and meritorious inventions under this important heading, the committee considered the "gang" plow, exhibited by A. Hammond, of Jacksonville, Illinois, to be the most important patented within the three years, and awarded to it the diploma and $20. The peculiar merit of this plow is in there being no "bar" required, and by the movement of a lever the entire weight of the plow is thrown upon the wheels. The plowshare passes through the ground at a uniform depth, the wheels adjusting themselves to the uneven surfaces. It is claimed that with this plow a

team will do twice as much work as with any other. It is also adapted for breaking or subsoiling.

The committee deemed the centrifugal sugar separator worthy of special mention. It was exhibited by Messrs. J. M. Bloomfield & Co., of St. Louis. It is an important invention, and is admirably adapted for the purposes for which it is designed.

Reapiny Machine, best.—The premium, a diploma and $20, was awarded to the reaper exhibited by J. B. McCormick, of St. Louis.

Mowing Machine, best.—Messrs. Kingsland & Ferguson, of St. Louis, entered a machine of Ball's pattern, which was pronounced by the committee and agriculturists "superior," and to it was awarded the diploma and $20.

Reaper and Mower Combined, best.—Messrs. Barnum & Bro. exhibited the reaper and mower of Whitely, Fauler & Kelley, of Springfield, Ohio, and to it was awarded the honor of being the most complete of all those entered for competition. Its management is easy, and its work expeditious and complete. To it was given the premium —a diploma and $30. It is light, and admirably adapted to the use of farmers who cultivate crops of wheat of from 10 to 50 acres, and cut over a corresponding quantity of land in grass.

PLOWS.

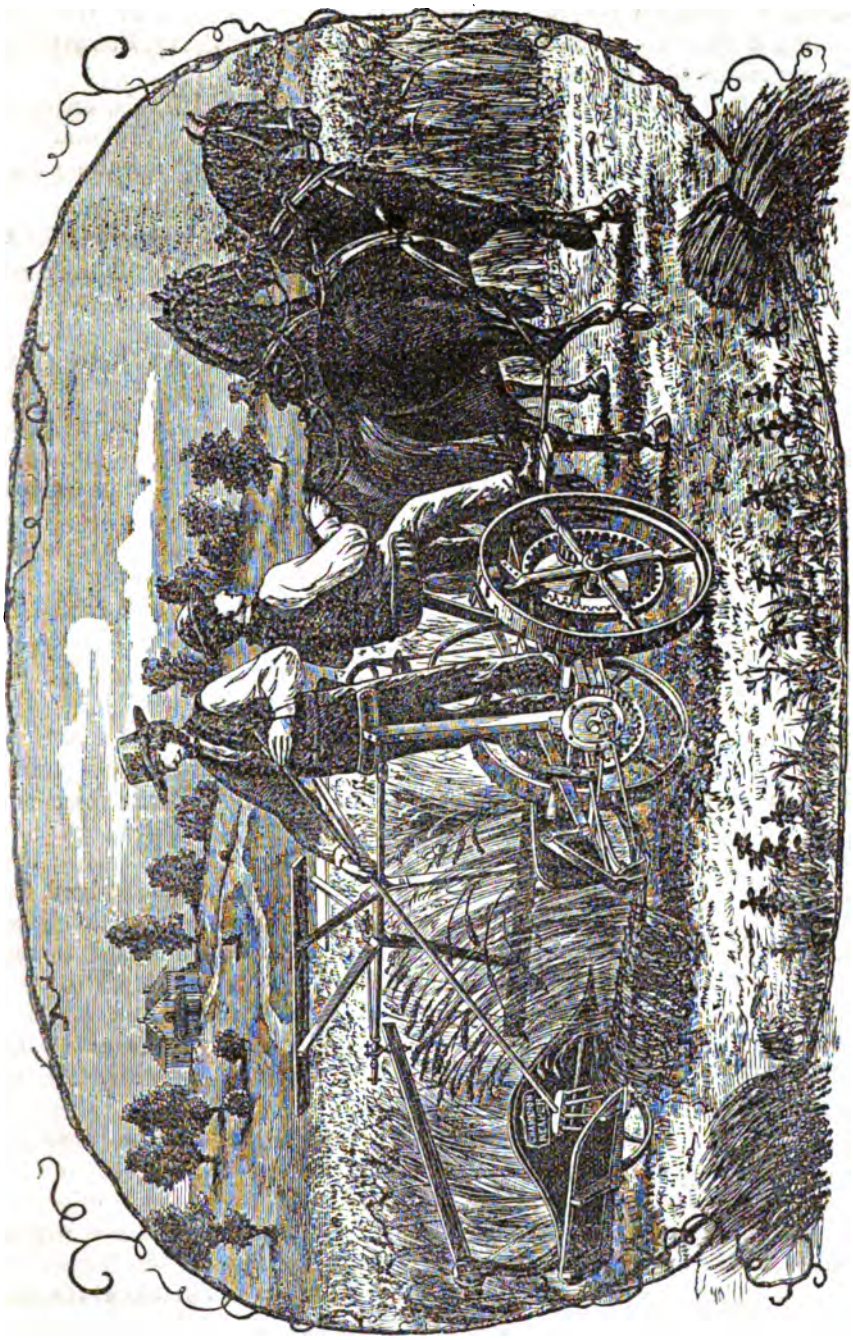
Fallow.—To Deere & Co., of Moline, Illinois, was given the first premium—a diploma and $5. This plow has merit, and was exhibited by W. Koenig & Co., of St. Louis. The second premium, a bronze medal, was awarded to T. & H. Smith & Co., of Pekin, Illinois. The finish of these plows is fine, and the material of the best.

Stiff Sod.—To the St. Joseph iron company, Michawaka, Indiana, represented by L. J. Bush & Co., St. Louis, was awarded the first premium, a diploma and $5, for a superior plow. It turns the sod gradually, and completely inverts it; is light of draft and runs deep. The second premium, a bronze medal, was given the plow of John Deere & Co., all of whose plows are justly celebrated. It was exhibited by William Koenig & Co., of St. Louis.

Light Sod.—The first premium, a diploma and $5, was awarded the plow of Collins & Co., of New York City, exhibited by Messrs. Plant & Bro., of St. Louis; the second premium, a bronze medal, to the plow of Messrs. Deere & Co., of Moline, Illinois, exhibited by William Koenig & Co.

Subsoil.—To the plows of Messrs. Deere & Co., exhibited by William Koenig & Co., was decreed the first premium, a diploma and $5; to the plow of W. B. Young & Co., of Chicago, Illinois, exhibited by Messrs. Plant & Bro., was decreed the second premium, a bronze medal.

Sod Subsoil.—The first premium, a diploma and $5, was awarded Messrs. Deere & Co., represented by Messrs. Koenig & Co.; the second to the St. Joseph iron manufacturing company, of Michawaka, Indiana, represented by Messrs. L. J. Bush & Co.



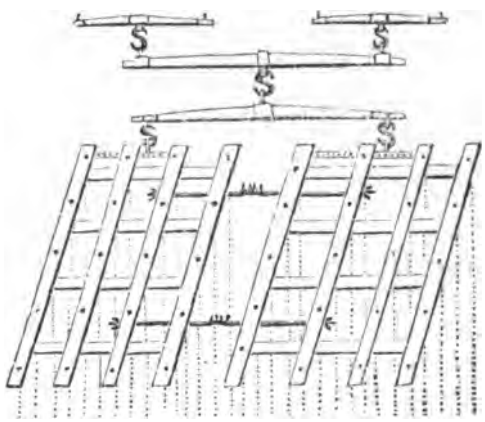
PREMIUM REAPER AND MOWER COMBINED, EXHIBITED BY MESSRS. BARNUM & BRO. (See p. 526.)

Side Hill.—The first premium, a diploma and $5, was awarded George C. Miller & Co., of Cincinnati, Ohio, represented by William Koenig & Co.; the second to Hall & Spear, of Pittsburg, Pennsylvania, represented by Messrs. L. J. Bush & Co.

Mole Drain.—Mr. A. Hammond, of Jacksonville, Illinois, entered a superior plow, and to him was awarded the premium, a diploma and $10. He also took the "grand gold medal of honor," for the same article, at the fair of 1860.

The committee on the above named articles, in class 1, 2 and 3, were Thomas G. Settle, D. W. Bryant, and James Miller.

No. 4—Rollers, Harrows, Cultivators, etc.



Harrow Exhibited by Barnum & Bro., of St. Louis, which took the First Premium at the Fair of 1866.

Harrows.—The first premium, a diploma and $5, was adjudged the harrow manufactured by Younglow, Massey & Co., of Cleveland, Ohio, exhibited by Barnum & Bro.; the second, a bronze medal, to one manufactured by the same parties, exhibited by L. J. Bush & Co.

Corn Cultivators.—The first premium, a diploma and $5, was awarded to Barber & Hawley, of Decatur, Illinois, represented by Plant & Bro.; the second to John Deere & Co., represented by William Koenig.

Hay Rake, Horse.—To Werner & Cromwell, of Chicago, was decreed the first premium, a diploma and $5; to Watson, King & Bro., of Springfield, Illinois, the second, a bronze medal.

Hand Hay Rakes.—To G. Gadkins, Appleton, Wisconsin, represented by Barnum & Bro., was awarded the diploma and $5.

Stump Extractors.—To Ferrell, Ludlow & Co., of Springfield, Ohio, represented by William Kœnig & Co., was decreed the first premium, a diploma and $5; to E. Spangenberg & Co., of St. Louis, the second, a bronze medal.

Ox Yokes.—The first premium, a diploma and $5, was awarded to

Hale, Davis & Co., of Fort Madison, Indiana, represented by L. J. Bush & Co.

Corn Harvesters.—To J. Butterworth, of Shelbyville, Missouri, the first premium, a diploma and $5, was awarded. It is admirably adapted to save labor.

Post Augers.—To How, of Rochester, New York, represented by Warne, Cheever & Co., a bronze medal was awarded.

Wheelbarrows.—The premium, a bronze medal, was awarded to Case, March & Wiggins, of Indianapolis, Indiana, represented by Plant & Bro., of St. Louis.

Of the miscellaneous articles in this class, for a wheel cultivator for corn and cotton, the first premium, a diploma, was adjudged Wm. C. Baker, of St Louis.

For combined Grain Drill and Broad-cast Seed Sower.—The premium, a diploma, was awarded D. & H. Rentchler, of Belleville, Ill.

For combined Harrow and Roller.—Premium to W. R. Mears, Grafton, Illinois, diploma.

The first premium, a diploma, was given the garden wheel cultivator of Parlme & Patterson, exhibited by W. C. Baker.

Farm Gate (wood).—Honorable mention to Wm. Langley, of St. Louis, was decreed. There was no iron gate for farm on exhibition.

To the corn cultivator of D. & H. Rentchler, of Belleville, Illinois, the premium, an honorable mention, was awarded. The judges pronounced it "a good single-horse cultivator, with adjustable shovels."

To the revolving horse rake of D. G. Tracy, of Janesville, Wisconsin, pronounced by the committee "an excellent improvement," a diploma was awarded.

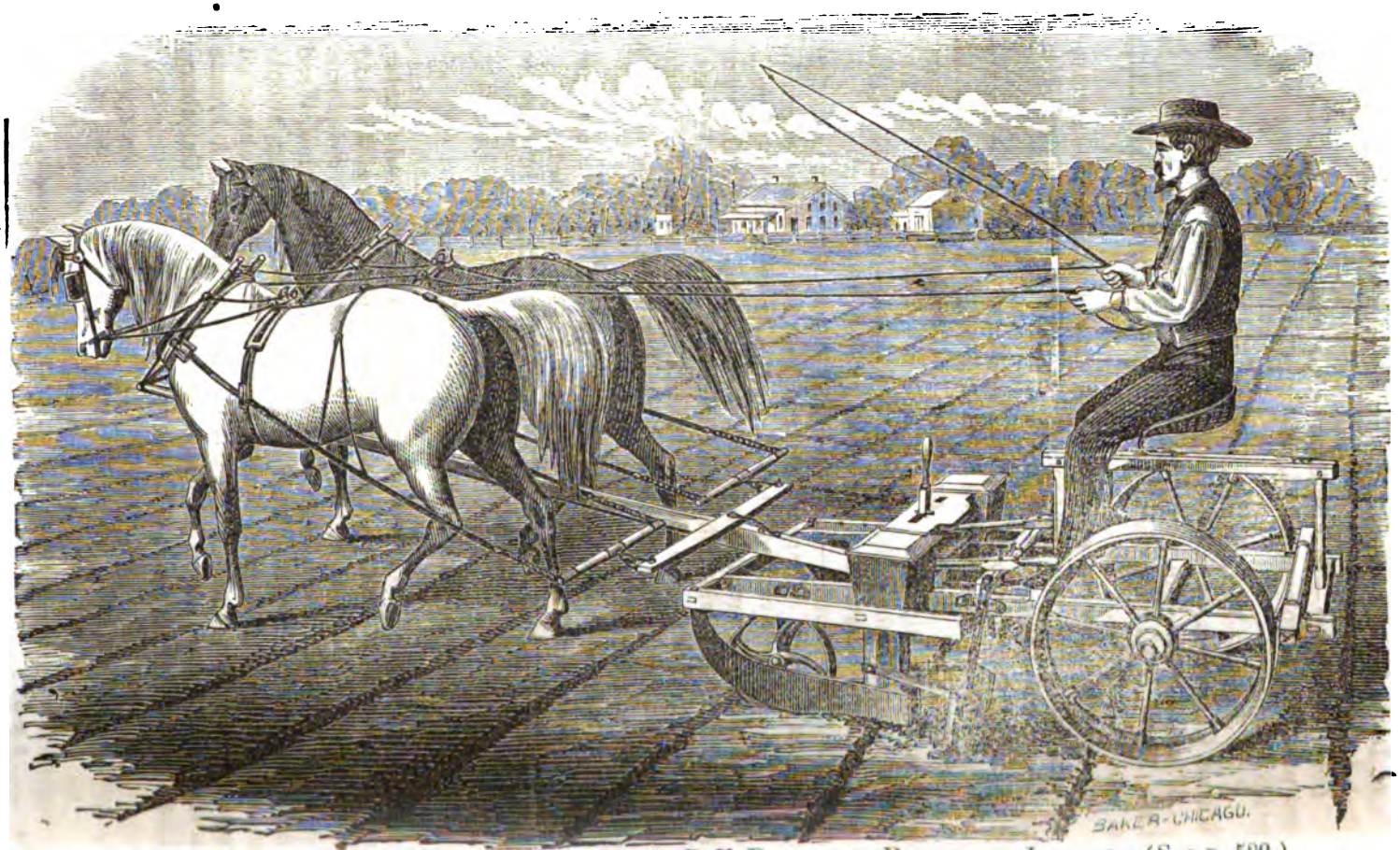
To the cultivator and gang plow combined, of John H. Baringer, of Montgomery county, Illinois, a diploma was also awarded.

The awarding committe on the above recited articles in class No. 4, were L. D. Morse, J. H. Clagett, and Bayles.

No. 5.—Planting and Sowing Machines.

Corn Planters.—To Herva Jones' patent, a double-hand planter, desirable for small farmers, invaluable for replanting, exhibited by Messrs. L. J. Bush & Co., was awarded the first premium, a diploma.

Corn Planter (Horse.)—To the planter of Messrs. Barlow, Wood & Co., of Quincy, Illinois, light in draft, accurate in dropping, simple in construction, exhibited by Messrs. Barnum & Bro., was also awarded a first premium, a diploma and $5; the second premium, a bronze medal, to the superior machine of George W. Brown, of Galesburg, Illinois, exhibited by William Kœnig.

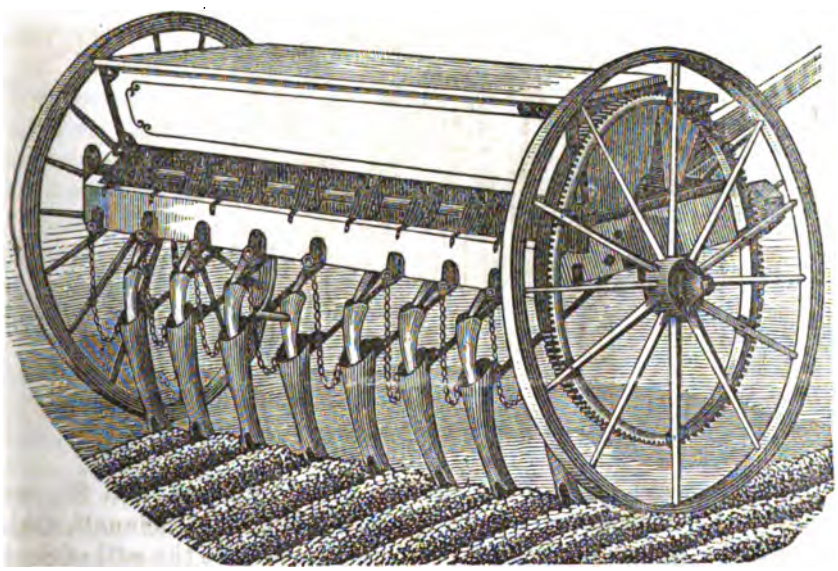


BROAD-CAST GRAIN AND SEED SOWER, BY D. H. RENTCHLER, BELLEVILLE, ILLINOIS. (See p. 529.)

Corn and Seed Planter (Horse.)—To Brown's improved Illinois planter, durable and simple in construction, represented by William Kœnig, was adjudged the first premium, a diploma and $5; to James Shelby & Co., Peoria, Illinois, for a superior machine, exhibited by Plant & Bro., was awarded the second premium, a bronze medal.

Grain Drills (Horse.)—The first premium was awarded to an improvement of superior workmanship, and highly adapted for the purpose intended, patented by McCormick & Baker, and exhibited by Barnum & Bro.; the second premium, a bronze medal, to the fine implement of D. & H. Rentchler, of Belleville, Illinois.

Broad-cast Sowers.—To the superior and well constructed implements manufactured by Warren Sparrow, of Portland, Maryland, exhibited by Messrs. Plant & Bro., both the first and second premiums were awarded. They are easily adjusted, sow with uniform thickness, and with any and certain quantity, wheat, barley, rye, oats and other small grains—its other prominent qualities we have not space to mention.



DRILL AND BROAD-CAST GRAIN AND SEED SOWER, ENTERED BY D. & H. RENTCHLER, BELLEVILLE, ILLINOIS.

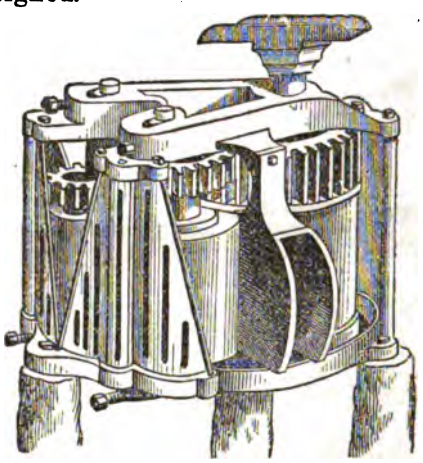
Threshing Machines.—To Kingsland & Ferguson, of St. Louis, was awarded the first premium for a machine of their own manufacture; they are simple in construction, and superior, as is attested by the premiums of the last three fairs; to Hanson & Co., of Alton, Illinois represented by Barnum & Bro., was awarded the second premium a large bronze medal.

Husking Machines.—The first premium, a diploma and $10, was given to Bruckenhoff, of Sandusky, represented by Messrs. Barrows & Warren, of St. Louis.

For Cornstalk Cutting Machine.—The first premium, a diploma and $10, was awarded Mr. Thomas Hazard, of Wilmington, Ohio, represented by Messrs. Clark, Killian & Co., of St. Louis; it has an endless belt, no cog gearing, is easily kept in order, and will cut by hand or power any desired length.

For Straw Cutting.—The first premium, a diploma and $10, was awarded the telegraph power machine, manufactured by Messrs. Blumyer, Bates & Day, Marshfield, Ohio, exhibited by Barnum & Bro.; the second, a large bronze medal, to Thomas Hazard, represented by Clark, Killian & Co.

Corn Sheller (Horse.)—The first premium, a diploma and $5, was decreed the Keystone sheller combined, of Messrs. Gatt, Tracy & Co., of Sterling, Illinois, represented by Plant & Bro.; the second, a medal, to the machine of Messrs. Pennock & Co., of Pennsylvania, exhibited by Plant & Bro. They are both excellent, and answer well the purpose for which designed.

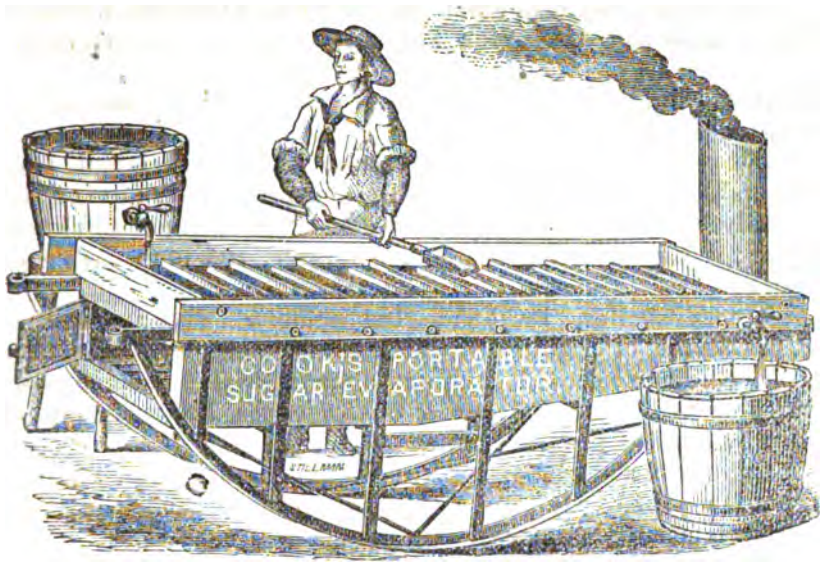


CORN AND COB MILL.

Corn and Cob Mill.—The first premium, diploma and $5, was awarded the machine, of Clarks, Sergow & Mach, Cincinnati, Ohio, exhibited by Barnum & Bro.; the second, a medal, to the mill of Sechler & Haven, of Cincinnati, Ohio, exhibited by Plant & Bro. They are both efficient machines, move fast, and are easy to work.

For Fanning Mill.—The first premium, a diploma and $5, was awarded to Messrs. Drury, Crane & Co., of Alton, Illinois; exhibited by Plant & Bro.; it is a fine fan, and a good separator; the second to H. N. Goodrich, of Aurora, Illinois, for the best fanning mill for garden seed—a bronze medal.

Cider Mill and Presses.—To Mr. Jesse Bowen's mill, of Alton, Illinois, was adjudged the first premium—a diploma and $5. It crushes the fruit easily and thoroughly; has great capacity; requires little power to operate it; the second, a medal, was given the machine exhibited by Messrs. Plant & Bro.



VICTOR CANE MILL AND EVAPORATOR.

Sugar Mill and Evaporator.—The first premium, a diploma and $5, was awarded the Victor cane mill and evaporator, manufactured by Clark, Sergow and Mach, Cincinnati, Ohio, exhibited by Messrs. Barnum & Bro. It is peculiar in this, that it has no scrapers; does not clog or choke; presses dry; does not crowd the cane; runs a constant stream of rich golden sirup; is easily put together and easy to manage. It is one of "the inventions of the age," and its reputation is rapidly becoming national.

Of the miscellaneous articles in this class, the awards were as follows:

Cotton Planter.—First premium, a diploma to B. Sprague, of Duquoin, Illinois; the second, an honorable mention to C. B. Brown, of Chicago, represented by Plant & Bro.

To H. N. Goodrich, Aurora, Illinois, was awarded the first premium, a diploma, for the best fanning mill for garden seed. It is a superior machine, and justly was Mr. Goodrich proud of it; it generally secures a blue ribbon wherever exhibited.

For the best horse power, Mr. Stewart Perry, of Newport, New York, obtained the first premium, a diploma. It has no chain wheel; needs no adjustment of cogs; no specially made chain; almost any speed or any direction of motion may be given the tumbling rod or belt; the frame is iron; the pendulum of other machines is done away with; the present tightener is small and has but one pulley. It is a complete machine, and answers admirably the purposes for which it was designed, for propelling threshing machines, saw mills, or other machinery.

For band cutter, the premium, a diploma, was awarded the Hoover patent, of Gallatin, Tennessee, exhibited by Clark, Killian & Co.

For cotton gin and condenser, the premium, a diploma, was given to Emery & Bro., of Alton, New York, represented by Messrs. Bush & Co.

Harvey Hunt's patent, Oskaloosa, Iowa, "sugar separator," the committee deemed worthy to receive an honorable mention.

To the convertible cider mill of Samuel Males, Cincinnati, Ohio, an honorable mention. It will shell corn, or press cider, wine or lard; it is easily convertible, and in all the above named capacities has no superior; is simple in construction; is durable, and in mechanism is ingenious.

For corn sheller, by hand, first premiun, diploma and $5, to P. C. Chipron, of Highland, Illinois, exhibited by William Koenig & Co., of St. Louis; second premium, a medal, to the machine manufactured by Whitmore, Belcher & Co., Chicopee, Massachusetts, exhibited by Plant & Bro., St. Louis.

Of sugar mill and evaporator, the Victor, manufactured by Clark, Sergow, Mach & Co., exhibited by Messrs Barnum & Bro., received the first premium, a diploma and five dollars.

For horse hay pitch fork, Plant & Bro. were the successful competitors for the first premium, a diploma.

Berger & Sisson's corn and seed planter came in too late to compete for the premium. It has drill attached; is self-acting on the same, and the committee felt it their duty to say "that the machine was equal to anything of the kind that had come before their notice," and decreed to it an honorable mention.

The committee on Nos. 5, 6, 7, in class "A," were Richard Berry, W. S. Pitts, Joseph E. Sale, and J. H. Shackelford, chairman.

No. 8—Shovels, Forks, and other Farming Utensils.

Hay Forks, half dozen.—This premium was awarded Warne, Cheever & Co., who exhibited the forks of Brown, Herman & Co., of Columbus, Ohio.

Manure Forks.—Barrows & Warren obtained the first premium for the forks of Bacheller & Son, of Wallingford, Virginia; Warne, Cheever & Co. got the second for those of Brown, Herman & Co.; also, the first premium for shovels, those of Ames & Son, North Easton, Massachusetts; also, the first premium for the spades of the same firm.

To Warne, Cheever & Co. was awarded the first and second premium for hoes—those of Eli Batch & Co., Massachusetts, and those of Rowland & Co., Philadelphia.

Root Cutter.—To the machine manufactured by D. Landreth & Son, exhibited by William Koenig, was given the first premium—diploma and $5.

Cabbage Cutter.—For this article Frederick Mack, of St. Louis, received the premium—a diploma and $5.

To Winchester, DeWolf & Co., of Whitewater, Wisconsin, was awarded the premium, a diploma and $5, for road scrapers, exhibited by L. J. Bush & Co.

Hay Pitching.—To the machine of D. B. Rogers & Son, Pittsburg, Pennsylvania, exhibited by L. J. Bush & Co., of St. Louis, the premium, a diploma and $10, was awarded.

BEST AND MOST NUMEROUS COLLECTION OF AGRICULTURAL IMPLEMENTS.

Messrs. Plant & Bro., Bush & Co., Koenig & Co., Kingsland & Ferguson, Kennedy, Roberts, Owens, Lane & Co., St Louis supply company, and hosts of others, from the city and from abroad, were well represented in all kinds of agricultural implements, from the largest to the smallest; but to Barnum & Bro. was decreed the first premium of $30 and a diploma. They had a full assortment of machineries and implements suitable for agricultural and other purposes.

No. 9—HOUSEHOLD AND MISCELLANEOUS.

Washboard.—First premium, a diploma and $5, was given to Kanitzer & Webber, of St. Louis; the second to W. A. Conway, of Milwaukee, Wisconsin.

Churns.—First premium, a diploma and $5, to H. W. White, of Olney, Illinois; the second, to Mathew Shaw, of Lawrence, Kansas. It requires no repairs and is durable.

For Brooms, 1 doz.—Premium, a diploma and $5, awarded to Harmon & Fay, St. Louis.

To J. S. Cram, of Chicago, Illinois, was adjudged first premium, a diploma and $5, for his washing, wringing and soaping machine; to the machine of George VanName, 88 North Sixth street, was decreed the second.

Hand Looms.—The first premium to Bromwell & Co., Cincinnati, Ohio, represented by Plant & Bro.; the second to J. B. Wait, of Waitville, Wisconsin.

Spinning Wheel (flax).—The first premium, a diploma and $5, to Pearce & Co., Chesterfield, New Hampshire, represented by Barnum & Bros.

Spinning Wheel (wool).—Premium to Mendenhall & Judd, Terre Haute, Indiana, represented by L J. Bush & Co.

Beehives.—First premium to the invention of H. A. King, Nevada, Ohio, exhibited by George M. Kellogg, of Independence, Missouri.

MISCELLANEOUS.

The Cane Knife and Stripper.—To Conorrois & Co., Camden, Ohio, a diploma was awarded.

Wheat Shaker.—Premium, a diploma, F. Rheydt, St. Louis.

For Flour Scoop and Sifter.—The premium to Eamschaw's, exhibited by Clark, Killian & Co.

Clothes Wringer.—First premium to R. C. Browning, of New York; second, to George VanName, St. Louis.

Meat Cutter.—Premium to Jon Segondy, of St. Louis.

Bag Holder.—Premium to J. S. Cram, of Chicago.

Wool Washing Machine.—Premium to E. Beckwith, South Pass, Illinois.

Portable Boiler and Furnace.—Premium, a diploma, to Mott & Co., of New York, represented by Barnum & Bro.

For Boiler Feeder, Chills for Casting Rollers, and for Dyamometer.—The premium for each was awarded to A. Hammond, of Jacksonville, Illinois. All three articles were meritorious.

The judges of class A, Nos. 8 and 9, were Richard Berry, Sebastian Sappington, and H. L. Long.

The committee awards to the miscellaneous articles, in class A, Nos. 1, 2, 3, as follows: To the glass plow of L. J. Bush & Co., an honorable mention; to the self-rake, reaper and mower, manufactured by the Buffalo agricultural and mechanical works, an honorable mention.

To the Doak combined planter and cultivator of Pitts & Co., of Chicago, exhibited by L. J. Bush & Co., a diploma was awarded.

To the gang plow of A. Hammond, Jacksonville, Illinois, a diploma; also to that of Battell & Collins, an honorable mention.

To Kennedy's eagle plow, for single or double horse, combined with cultivator for potatoes or corn, and adapted to stiff or light sod, an honorable mention was decreed; also to the four-gang plow of M. Kennedy, of St. Charles, Missouri, exhibited by Barnum & Bro., honorable mention.

KENNEDY'S EAGLE PLOW.

To the garden plow of John M. Crawford, New Castle, Kentucky, honorable mention.

To the combined plow and drill of Messrs. Barberaux & Co., Louisville, Kentucky, honorable mention.

To the weather strip for door, of D. R. Leverton, Quincy, Illinois, honorable mention.

The judges were Thomas G. Settle, D. W. Bryant, and James Miller.

Grain Drill Fluke.—To the superior machine, manufactured by D. & H. Rentchler, of Belleville, Illinois, a diploma was awarded.

Sugar Separator in Molasses.—To Harvey Hunt's patent, Oskaloosa, Iowa, exhibited by J. M. Bloomfield & Co., of St. Louis, a diploma was awarded.

Wool and Charcoal Sirup Filterer.—Manufactured by J. L. Smith, Tuscola, Illinois, a diploma was awarded.

STATE OF MISSOURI—*County of St. Louis:*

Harrison L. Long, being duly sworn, on his oath, that, on or about the 25th of May last, he set out (in slips) one-fourth of an acre of land in sweet potatoes—making over fourteen hundred plants, one plant to the hill; about two and a half feet one way and three feet the other; and that he dug out of the said piece of ground ninety-eight and a half bushels (98½).

The soil, loose hickory and black jack land, and third year's ground. Slips taken from the hot-bed, set out in hills about the 25th of May; plowed once and hoed twice. The ground had been prepared, previous to planting, by being plowed twice, deep.

Also, that he raised, on one-half acre of land, one hundred and thirty-seven (137) bushels Irish potatoes. Soil, old meadow land. Amount of seed planted, about eight and a half bushels (8½); small cut; planted about the last of May, and dug out the last of October. Ground broke deep, twice, and laid out three feet one way and two feet the other; plowed twice and hoed once. The potatoes, in the above cases, were measured with sealed measure—half bushel. Both crops were good, and potatoes large and fine. H. L. LONG.

Subscribed and sworn to before me, this the first day of November, A.D. 1866; as witness my hand and seal of office, at St. Louis.

S. W. EAGER, JR.,
Clerk St. Louis County Court.

I, Wm. H. Long, certify that I measured for Harrison H. Long, on his farm in St. Louis county, a parcel of land on which were growing sweet potatoes, embracing one-fourth of an acre (¼). The soil is light clay, and third year's ground, on the waters of Gravois creek.

Measurement of sweet potatoes, to wit: 1.50 chains by 1.60 chains—one-quarter of an acre.

Also, at the same time, I measured for the same person, on said ground, a lot of ground upon which were growing Irish potatoes, embracing one-half (½) of an acre of land; the soil is light, loamy and old land, being part of an old clover meadow.

Measurement of Irish potato ground, 2.50 chains by 2.00 chains—half an acre. WM. H. LONG.

Subscribed and sworn to before me, this first day of November, 1866; as witness my hand and seal of office, at St. Louis.

S. W. EAGER, JR.,
Clerk St. Louis County Court.

Class B.

MACHINERY DEPARTMENT.

GERARD B. ALLEN, *Superintendent.*

Civilization, refinement, human progress, advancement in wealth, are all whispered in the workings of the steam engine. Witness the busy scene in this department—in this leviathan foundry—with its engines, its locomotives, its fire engines, its hemp-brakes, its card and printing presses, its flouring, its grain, its saw, its fanning mills; its spoke-dressing, hub-boring, mortising turning, shingle-making, stone-dressing, shoe-pegging, brick-making, type-making, and various other kinds of machines, and one cannot but become hopeful for the further progress of mankind, and sanguine of the further development of the wealth of the nation.

To develop the mighty resources of Missouri; to make St. Louis what she is destined to become—the first manufacturing city of the world—must be the triumph of machinery; without its help, this result cannot be accomplished.

Will not the iron now resting on the surface of the soil of our, and the other untold metals now slumbering untouched within her bowels, be manufactured into machinery, which will traverse the sandy deserts and frozen mountains; which will carry commerce further than the lands visited by the Phœnicians, or conceived by the wisdom of the Greeks; which will bring back wealth from regions where the mighty hosts of Sesostris or Alexander never penetrated, or the victorious Roman eagles ever ventured?

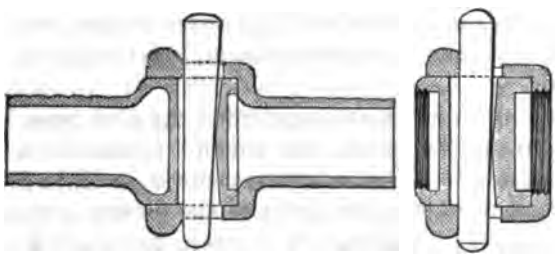
The importance of this department was attested by the very creditable display of machinery which was made in it. In conclusion, we will add, wait a little longer, and we will not have waited in vain; the valuable metals, all within three hours' ride of St. Louis, will be awakened from their sepulchre, and new life will be kindled on the banks of the Mississippi, owing, in no small degree, to the fostering care of the agricultural and mechanical association.

The awards in this most valuable and interesting class, filled as it was with a varied assortment of fine and useful machinery, were as follows:

No. 1.—ENGINES, ETC.

Model Locomotive and Tender.—For the best model locomotive and tender, the first premium was awarded to Mr. Williams, of St. Louis, who is the maker, and who was represented in the exhibition by the St. Louis railway supplies manufacturing company. This

machine is one of the finest exhibitions of mechanical skill which has come under our observation, and was the center of attraction in the part of the building where it was located. Mr. Williams, we understand, constructed and build this model while an apprentice in the Pacific railroad shops of this city. Premium, a diploma and $20. It was made by H. J. Williams and exhibited by Le Roy Bartlett, of St. Louis.



CAR-COUPLER, BY HIMMANS & CO., JACKSONVILLE, ILL., (See p. 540).

Steam Engines.—For these the premiums were very liberal. This is as it should be. The maker of a superior engine is a benefactor. There was much competition. The first premium, a diploma and $100, was adjudged the engine exhibited by G. H. Timmerman, & Co., of St. Louis. It was a stationary steam engine of superior workmanship and finish. Mr. Timmerman has been awarded premiums at several of the preceding fairs. To Messrs. Owens, Lane, Dyer & Co., of Hamilton, Ohio, was awarded the second premium, $50, for a very beautiful, finely finished and perfect stationary steam engine. Space forbids us to say more. The display of steam engines was both flattering to the association and creditable to the skill and talent of the manufacturers of them.

Steam Fire Engine.—For this premium there was much rivalry, and the merits of the respective engines had to be tested by actual experiment. This was agreeable to the wishes of the friends and advocates of the contesting machines, and especially diverting to a portion of the immense crowd within the fair grounds. The locomotive fire engine, yet unchristened, from the manufactory of Messrs. Lane & Bodley, of Cincinnati, Ohio, a most beautiful and highly finished piece of mechanism, with its nicely fitted joints and brilliant polish, was first moved within reach of the artificial lake within the inclosure of the grounds. The Thornton, her rival, a rotary steam fire engine, belonging to the city of St. Louis, of such finish and mechanism as to show that every part of her must have been the work of a master mechanic, amid the huzzas of the multitude, next took her station. The trial began. Hose exactly similar, two and a half inch and five hundred feet in length, was attached to each. The nozzles were an inch and one-eighth. Fire was applied to both at the same time, and in seven minutes the Cincinnati engine began to throw water. The Thornton was four minutes later. If any difference existed as to the distance

water was thrown, it was in favor of the Thornton; but in this respect they were pretty equally matched; it was about two hundred and forty feet. The Thornton was drawn by two magnificent draught horses; the Cincinnati engine by four, but on level ground she moved off gracefully, propelled by the motive power furnished from her boilers. She entered the arena and made two or three circuits around the amphitheatre, much to the delight and admiration of the many thousands of persons congregated there who had never before seen a steam fire engine, without ostensible motive power, traversing an ordinary dirt road.

To the Cincinnati engine was awarded the first premium, a diploma and $25; to the Thornton, the second premium, a large bronze medal. The cost of the latter, manufactured by H. C. Silsby, of Seneca Falls, N. Y., was $6,000; the price of the former is $8,000.

Messrs. Geo. W. Fisher, Geo. W. Cotton, and Joel F. Allison composed the awarding committee.

For a farm engine, a very perfect piece of mechanism, made with all the precision of watch work, Messrs. Owens, Lane, Dyer & Co., of St. Louis, were awarded the premium—a bronze medal.

Combined Governor Valve.—The first premium, a diploma, was decreed to Gardner & Robertson, of Quincy, Illinois. They were represented by their agents, the St. Louis railway supplies manufacturing company, who exhibited "Gardner's patent automatic stop governor." It is of acknowledged superiority, and the one that surpasses it must be meritorious indeed.

For the private premium offered by the Citizens' railway company, for the best invention to prevent persons from being run over by the street car wheels, there was much competition and many entries. C. H. Boyle, of St. Louis, No. 126 Third street, was the fortunate competitor. The premium was a magnificent set of silver tea service, valued at $500.

The premium, a diploma, for street railway car gate, was awarded to C. H. & J. W. Peck, of St. Louis.

Hub Boring Machine.—For a superior invention, exhibited and patented by Messrs. Durant, Van Aisdole & Co., of Kenosha, Wisconsin, a bronze medal was awarded.

Messrs. Himmans & Co., Jacksonville, Illinois, were adjudged a bronze medal for the best "car coupler or drawback" on exhibition.

For Heater and Lime Separator.—Messrs. Crawford & Stillwell, of Dayton, Ohio, were awarded the premium, a bronze medal. To Wm. Brown, of Macoupin county, Illinois, for a model, an honorable mention was made.

For a Mortising and Tennoning Machine.—Of superior construction, Wm. Zimmerman, of Quincy, Illinois, was the fortunate competitor, and obtained the premium, a diploma.

Shingle Machines.—To Fuller & Ford, of Chicago, represented by the St. Louis railway and supply manufacturing company, was awarded

the premium, a bronze medal. The fine finish and workmanship of this machine attest that it will accomplish what it proposes satisfactorily,

Engine Lathe.—Jacob Felber, of St. Louis, obtained the premium, a diploma.

Sewing Machines.—To Wm. S. Roberts, of St. Louis, was awarded the premium, a diploma. This machine has recent improvements, is both simple and accurate; it attracted general attention.

Brick Making Machine.—To the powerfully constructed brick molding machine, "a self-mixer," kneading to a proper temper itself, which sometimes, without even being moistened, is cast into a heavy cast-iron hopper, in which it is worked or kneaded by flanges attached to a shaft, which is operated by a pair of horses hitched to a lever like a cider or sugar mill, the first premium, a diploma, was awarded. The invention is meritorious. It belongs to E. R. Gard, of Chicago. The clay takes one step from the hopper to the molds in a revolving bed beneath, then the pressure, and bricks leap forth as if by magic, in any required shape.

To A. K. Halteman, of St. Louis, was awarded the first and second premiums for flour packing machines. The two machines thus honored were the Phœnix, and Cook's imported flour packers. A diploma was given one and a medal the other.

A. K. Halteman also obtained the premium, a bronze medal, for Vandergriff's patent smut machine and separator, combined. This is an excellent machine.

A. K. Halteman likewise was awarded a bronze medal for the "oats and weed extractor," patented by Vaugh, and manufactured by Turner, Fox & Co., of Ohio.

For the best horse collar stuffer, W. H. Haywood, of Philadelphia, represented by W. A. Johnson, No. 122 Pine street, was awarded the premium—a bronze medal.

No. 9.—Best Hemp Brake Machine.

Of those entered, all were superior inventions. The one exhibited by Gelston Sandford, of New York City, took the first premium, a diploma and $50.

For the best hemp cleaner, a diploma awarded the machine of George W. Campbell, of Fulton county, Illinois, exhibited by James L. Benson, St. Louis.

To Iskey's cigar press, exhibited by Clark, Killian & Co., was decreed a favorable mention.

Portable Log Sawmill.—The first premium, a diploma, was awarded Kingsland & Ferguson, of St. Louis; manufactured by them for eighteen years, it has been thoroughly tested, and will perform what is claimed for it. Its mechanism is superior. A recent improvement in head blocks causes the log to move at both ends at the same time, and accurately. Another improvement in the friction feed prevents the liability to breakage in the head-gear. The second premium was

taken by Messrs. Owens, Lane, Dyer, & Co., for a mill of superior mechanism, scarcely inferior to its more fortunate competitor.

To Darius Parkhurst, of St. Louis, a favorable mention for head-block was decreed.

To the fanning mill, silent feeder, and grain separator of Bradford & Cunney, Cincinnati, Ohio, exhibited by A K. Halteman, a bronze medal was awarded. To John Hutchinson, of the same city, a favorable mention was decreed.

Hutchinson's Silent Feeder and Grain Cleaner.—This is a very neat machine, and is set upon the hoop over the stone, and receives its motion from the stone. The object is to subject the grain to a complete cleaning, extracting all impurities, such as cheat, cockle, etc. The fan creates a suction of air drawn from underneath, and passes it horizontally through the grain as it falls over the revolving saucer, and carries it in a rapid current out of the discharging spout. A cap, which is made to guage the amount of air-draft necessary, is placed directly over the fan, and is so arranged that, by opening or shutting, a strong or weak current may be forced through the grain.

To the wood-splitting machine of John A. Knight, corner of Fourth and Spruce streets, St. Louis, a favorable notice was decreed.

Knight's Patent Missouri Wood-Splitting Machine.—This machine is simply a cast-iron block, solidly placed on a log, firmly imbedded in the ground; the block is tapered at the top, forming four wedges or knives, on which the wood is placed by an attendant. The hammer slides between two rods and is lifted by a rope attached to a loose crank, and is carried round by a pin in one of the gearing wheel arms until it reaches a vertical position, when it falls forward, and the hammer descends, splitting the wood into two or four parts.

To the drag sawmill of Case, Marsh & Co., Indianapolis, makers, entered by Plant & Bro., St. Louis, a diploma was awarded. Also, to the one of Lennard & Cushman, of Springfield, Ohio, exhibited by Wm. Kœnig & Co., a bronze medal was awarded.

For engine lathe, the one manufactured by the Gould machine company of Newark, New Jersey, represented by the St. Louis railway and supplies manufacturing company, obtained the premium.

Iron Drill Press.—For the best drill press, the first premium was awarded to D. L. Harris & Co., of Springfield, Massachusetts, who were represented at the exhibition by the St. Louis railway supplies manufacturing company, who are their agents in this city. This is one of the finest tools we have ever seen. Many of the best machinists present pronounce this a most convenient and elegant drill press.

Iron Planer.—For the best iron planer, the first premium was awarded to the St. Louis railway supplies manufacturing company, who exhibited a six-foot planer, manufactured by D. L. Harris & Co., of Springfield, Mass., who rank as among the very first manufacturers of the country. This planer possesses some points of improvement not found in the ordinary planer.

Bolt Cutter.—For the best bolt cutter, the first premium was awarded to the St. Louis railway supplies manufacturing company, manufactured by D. L. Harris & Co., Springfield, Mass.

For planing, tonguing and grooving machine, Richardson, Merriman & Co., Worcester Mass., a bronze medal. Represented by the St. Louis railway and supplies manufacturing company.

Scroll Saw Machine.—J. A. Fay & Co., Cincinnati, Ohio, a diploma. Represented by the St. Louis railway and supplies manufacturing company.

To the re-sawing machine of G. Fay & Co., Cincinnati, Ohio, represented by the St. Louis railway and supplies company, a favorable notice was awarded.

Iron Frame Tenoner.—Diploma. Exhibited by the same parties as above, manufactured by J. A. Fay & Co., of Cincinnati.

To Fuller & Ford's slat tennoning machine, stave pointer, and single and heading joiner, exhibited by the St. Louis railway supplies and manufacturing company, favorable notices for each was decreed.

Excelsior Gold Quartz Stamper (by steam).—Excelsior stamper company, Baltimore, Maryland; entered by P. M. Papin, St. Louis, diploma.

Mr. P. M. Papin, of this city, has, for the Baltimore stamping company, models of a new and most complete quartz crusher, of four stamps, constructed entirely of wood, except the "shoes" for the stamps. This machine is one that has long been desired by miners, and can be built at any point where timber can be procured. The other is a model on the same principle, but of far greater power, having sixteen stamps. This last machine is designed more particularly for capitalists, as it is almost entirely of iron. To both of these machines is attached the Mexican "arastus," by means of which nearly the last particle of the precious dust is secured. These machines are also adapted to pumping and lifting water.

To the six-inch shaping machine, manufactured by Gould's machine company, Newark, New Jersey, exhibited by the St. Louis railway supplies and manufacturing company, was awarded a bronze medal.

The display of iron and wood working tools by the St. Louis railway supplies manufacturing company was truly magnificent, and we imagine that all concede that the energetic and successful effort of this company to bring the products of the very best machine shops of the country into exhibition at this great fair is entitled to all praise.

Adjustable Grain Measure.—H. Kraut, St. Louis; bronze medal.

Planing Machine.—Jacob Felber, St. Louis; diploma.

Metallic Nut Machine.—R. H. Cole, St. Louis; diploma.

Fire Sprinkler.—E. Shotwell, Ashland, Ohio, maker, entered by F. H. Detroy, Cincinnati, Ohio; diploma.

Hose Carriage.—Jost & Yeakel, St. Louis, Missouri; diploma.

Griffith's Patent Ventilator and Smoke Conductor.—W. S. Roberts; first premium.

Gas Retort of Fireclay.—Samuel Hambleton, St. Louis; first premium.

To the wheel machine manufactured by C. W. Corry, of Carlinville, Illinois, an honorable mention was decreed.

Class C.

MECHANICAL DEPARTMENT.

E. A. MANNY, *Superintendent.*

Glance at the hasty record here sketched of this department. Short as it necessarily is, and failing to portray as it should the various powers here at work in our very midst, for the future wealth and prosperity of St. Louis, yet even at it the eye cannot fail to kindle with emotion. We see new manufactories starting into existence as if by magic, and that, too, in such vast numbers that we can hardly keep pace with the rapidity of their creation; we see the wants of our time and of our country being supplied at our very doors; we see our youthful city gradually girding on the manly gown, and vieing in almost every article of domestic use with the older manufacturing communities; we see the swelling tide of life and action that is animating our citizens; we see our city slowly but surely gravitating to her destiny—to become the first manufacturing city of the world; we see elements at work here that will leave behind them lasting results.

Pause, stranger, before entering the mechanical hall. A little more than a year ago sick and wounded men lay strewn all over its floors. They were soldiers. Around its walls the gloomy sentinel kept up his silent tread; above the roof floated the banner that was being bathed in blood; before the door gleamed the bayonet that was fertilizing the land in fraternal blood. The scene, how changed! All has melted as a dream, or vanished as a vision of the night. A sentinel of a differ, ent character now stands at that same door. He challenges the comer: who goes there? He hears the response: it is mechanical skill; it is mechanical industry. Who goes there? It is peace and national prosperity. Who goes there? It is an army, not laden with the trophies of war, each one wet with the tears of the widow, the orphan or the patriot; not burthened with the fine arts, which it regards as unutilitarian; not with the marble chiseled into beauty by the hand of Phidias; not with the works of the age of Pericles dug from the foot of the acropolis. No! It comes reflecting the character of this age and of this people; it comes laden with articles of practical utility; with those articles that will bring yellow, precious, glittering gold, which is the god of its idolatry; with jewelry, plated silver ware and fire arms; with musical and surgical instruments, and artificial limbs; with furniture, upholstery and cutlery; with iron, tin, brass, willow, wooden, glass and hardwares; with furs, hats, caps, harness, trunks, saddles, valises, malleable iron goods, cooking ranges, stoves, lamps,

lanterns, etc.,—all plundered from the raw materials of the lands it ravaged.

And the "gist" of the matter is, that this novel army of chevaliers d' industrie, native and to the manor born, have, by their hardihood, enterprise, skill and industry, so filled the market in the articles above enumerated, and intend to do so for the future, in so complete a manner, that the wants of the people of the west can be supplied in St. Louis on as advantageous terms as in any market of the Union That's were the "gazelle" comes in.

The exhibition in this department eclipsed that of any previous year, and in elegance and beauty of arrangement fell behind no department of the great fair.

No. 1.—APPARATUS AND INSTRUMENTS OF FINE WORKMANSHIP, TO BE EXHIBITED BY THE MAKER ONLY.

Philosophical and Mathematical Instruments (best display).—To A. M. Leslie & Co., the premium, diploma and $20, was awarded. The display was a very fine one, consisting of everything which goes to make up a full and complete set of philosophical and mathematical instruments. They were highly finished.

Surgical Instruments (best display).—The premium, diploma and $10, was accorded to A. M. Leslie, St. Louis. They consisted of a complete set of amputating instruments and eye instruments, equal to the best imported French instruments of the same kind. Indeed, Mr. Leslie says that all the choice instruments in his shop are of his own manufacture, and are much more reliable than anything that he can buy. They were some of the best improvements; and the display was very fine.

The same gentleman also exhibited a full and choice display of dental instruments, of his own manufacture, for which he received the premium, diploma and $5. They were gold and pearl mounted, and highly finished. He had, also, a very valuable gold dust compressor, manufactured for one of our leading dentists, on exhibition.

To the same gentleman was given the premium for the artificial teeth of S. J. White, of Philadelphia; they are justly celebrated; they have all the enameled beauty of natural teeth. To Mr. Leslie was awarded the premiums on the two last above named articles at the preceding fair.

For artificial teeth, the committee accorded an honorable mention to those exhibited by Reed & Bristor, of Macon City.

Artificial Limbs.—The exhibition of artificial legs, arms, hands, feet, etc., was large. Had Falstaff seen this ingenious display, he might have been more in love with "honor." For the best display, the premium, a diploma and $20, was awarded Dr. D. Bly, No. 413 Pine street.

For durability and simplicity of construction the work of R. M.

Vaughn, southeast corner Eighth and Pine, was highly commended by the committee. This artificial leg has a metallic ankle, and has no cords or springs. For "fire alarms" the premium, diploma and $10, was awarded Jacob Felber, of St. Louis.

Collection of Bandages, Trusses, etc.—The articles in this class exhibited a high state of finish; there were trusses, supporters, shoulder straps, etc., of endless variety and adaptability; by them, it would seem that any deformity or defect of the frame might be removed. Chas. Schleiffarth was the fortunate competitor for the premium, a diploma and $10. Mr. S. also received an honorable mention for the same articles at the last fair.

For Medical Vaporizer.—Special commendation and a diploma was awarded Henry Kraut, of St. Louis.

The judges on the above named articles were Drs. J. J. Clark and E. S. Lemoine, and C. W. Spalding.

The case of railroad car trimmings, and railroad lamps and lanterns; rubber belting of the Boston belting company; locomotive steel-springs; steam gauge of J. L. Eastman & Co., Boston; boiler felting; locomotive head light, exhibited by the St. Louis railway supply manufacturing company, were all accorded premiums, a diploma being given for each separate article above enumerated.

No. 3.—Silver, Gold, Brass, and Copper Ware, Wire, Watches, Clocks, etc.

Silver Ware (best display).—To Eugene Jaccard, who had the largest stock on exhibition, was awarded the premium, a diploma and $30. Gold watches, of the most skillful construction and finish, some engraved, some enameled and set with diamonds; solid silver tea sets and salvers, very massive and elegantly wrought; castors, cake baskets, slop bowls, etc., etc., were among the articles of this rich and elegant display.

To E. Jaccard was also accorded a premium for his scarcely less magnificent display of plated silver ware.

For best chronometer, E. Jaccard was awarded the premium, a diploma.

Watches.—The display was superb, each of the entries being large. The premium, diploma, was awarded both to D. C. Jaccard & Co., and to E. Jaccard. The display was very fine, and the committee expressed great satisfaction as to number and quality. Here were those of the manufactories of the well known houses of Jurgeson, Adams, Fordsham, Tobias, etc., as well as those of St. Louis manufacture.

For a puzzle ring, the committee recommended a diploma, being much pleased with the ingenuity of the contrivance; the inventor was Frederick Van Boken, of St. Louis.

For the best watch manufactured in Missouri, Eugene Jaccard obtained the premium, $50.

For Clocks (week, best).—W. H. Edes, premium, diploma.

For One Day Clocks (best).—W. H. Edes, of St. Louis, obtained the premium, a diploma. To D. C. Jaccard & Co., the premium, a diploma, was awarded for clock, compensation pendulum.

Committee, Wm. C. Defries, F. W. Roberts, C. O. Gaines, R. Beauvais.

No. 4.—Worked Metals, Iron, Tin, etc.

The excelsior manufacturing company, of St. Louis, exhibited almost if not every variety and description of cast-iron ware. The display was pronounced by the committee "very good." It is pleasing to see the enterprise and mechanical skill here manifested. It is the work of our own artists. To this company was awarded the first premium, a diploma and $5, for the best display, various sizes, of iron ware.

Japan Tinware Display.—The St. Louis samping company had on exhibition various articles of tin and sheet iron stamped or pressed into shape, and not shaped by the ordinary mode, hammering. They are the first company of this character in Missouri. Their Japanned tea caddies, waterstands, waterpots, etc., made a fine display, and, in the words of the committee, "was very good." They had also a fine display of brassware "spun." To them was recommended the premiums for Japan ware, tinware, pressed tinware and tinned ironware.

For horseshoes, made by Edward Butler, of St. Louis, exhibited by John Busby, St. Louis, was decreed a premium. The invention was pronounced good.

Messrs. Warne, Cheever & Co. received a premium and favorable notice for the shovel and tongs, made by J. Schofield & Sons, of New York. To these gentlemen was also awarded the premium for tacks—those of the Taunton, Massachusetts, tack company.

To Wm. S. Roberts, corner of Seventh and Washington avenue, was awarded the premium for an improved ventilator and smoke conductor.

For a vacuum handle "milkpitcher," Messrs. Clark, Killian & Co. were awarded a diploma. To the same gentlemen, for vacuum handle oil can, a premium was decreed, a diploma.

For chimney top, a premium was awarded A. L. Gascvich, of St. Louis. A diploma to Messrs. Hicks & Welkin, of St. Louis, for "pattern cut-off."

The St. Louis railway supply manufacturing company, who contributed so much to the exhibition by the large show they made of everything necessary for the furnishing or repair of the rolling stock of a railroad, car trimmings, a great variety of brass goods, etc., were again awarded the premium, a diploma, for each of the articles here mentioned: For cast steel, manufactured by Hussey, Wells & Co., Pittsburg, Pennsylvania; for scroll chucks, manufactured by A. L. Cushman, Hartford, Connecticut; for signal bell, manufactured by L. Gregg, Brighton, Illinois; for seamless brass and copper tubes, manufactured by the American tube company.

The committee were E. C. Quinby, P. Wonderly and F. D. Turner.

No. 5—Brass, Copper, Bell Metal, etc.

Brass and Copperware, best display, diploma.—There was much competition. The display was very fine, consisting of lamps and of every other article into which brass is manufactured. The excelsior manufacturing company received the premium, a diploma and $10.

For the best brass work display, the St. Louis samping company were the fortunate competitors. They were the winners of the diploma.

Church Bells.—Messrs. Myer & Ruppenthal took the premium. They stood at the entrance of the great mechanical hall, were frequently sounded, and their soft, clear and musical tones resounding throughout the whole grounds, seemed to cheer and enliven the spirits of the thousands there assembled.

Stock Bell.—That of J. C. Moore, exhibited by Warne, Cheever & Co., got the premium.

The St. Louis railway and supply manufacturing company was awarded the premiums for hotel signals, for the best display of lamps, and for brass work, and for brass tubing; also, for best display of railway machine shop supplies.

Leadpipe Coupling.—Shone & Akerson, of Carondelet, were awarded the premium, a diploma.

Soda Fountain and Water Cooler combined.—There were some fine specimens exhibited under this heading. To S. S. Lippincott, of St. Louis, the premium, a diploma and $10, was awarded. These same fountains were similarly honored at the preceding fair.

To Augustus Wetzel, of St. Louis, was awarded a premium, a diploma, for the best copper-still. Committee as before.

No. 6—Castings.

Stoves, best display, diploma and $20.—The stoves exhibited were probably the finest ever looked upon at a fair. The display was elegant, embracing every variety; the stove manufactories of the city and adjacent country seemed to have concentrated their best articles and newest improvements there. To the excelsior manufacturing company, of St. Louis, was awarded the premium for the best display, and also the premium for laundry, wood or coal stove.

The premium, a diploma and $10, was awarded Messrs. Buck & Wright, Nos. 187 and 189 Main street, for the best wood cooking stove; also, for the best parlor stove. They had twenty different patterns of stoves on exhibition; all were of superior finish. To them was awarded the same premium at the preceding fair.

For stoves for cooking with coal, for best appliance for warming house, and for cooking ranges, Charles F. Whorf & Co., 712 Washington avenue, were awarded the respective premiums; for the first, a diploma and $20; for the other two a diploma and $10. He had a large variety of parlor, office, cooking, tailor and other stoves on exhibi-

tion. Mr. Whorf obtained several premiums at the preceding fair. His coal stove is well adapted for burning soft coal.

To John E. Oxley, No. 503 North Levee, was adjudged the premium for the best hotel stove. It answers well the purpose for which it is designed.

MR. OXLEY'S HOTEL STOVE.

To Messrs. Turner & Bro. were awarded two premiums in this class; one for the best hotel range for cooking, the other for the best portable cooking range, a diploma and $10, respectively. They are superior inventions, well arranged and complete. The Lindell hotel has one of the large size now in use.

To Lewis Meyer, 2123, South Second street, was given a premium for the best meat broiler. It broils admirably, prevents the blaze from reaching the meats, and thus preserves their full flavor.

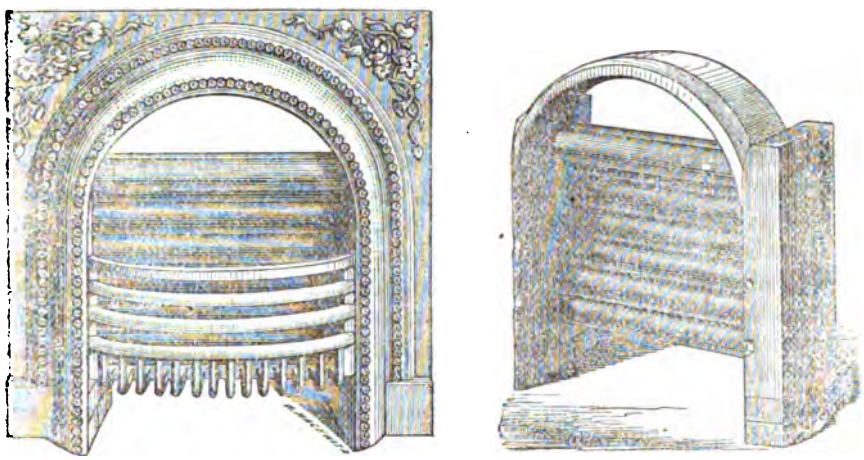
The committee were G. H. Zimmerman, J. E. Oxley, C. W. Fox, and J. O. Bell.

No. 7—CAST IRON—MISSOURI MANUFACTURE.

The S. R. Fox manufacturing company, Franklin avenue and Twenty-first street, had on exhibition an almost endless variety of articles of malleable and gray iron castings, including andirons, hinges, clevices, wrenches, shears, etc., etc., all made in whole or in part of Missouri iron. This exhibition at once establishes the quality of our native metal and the value of this character of manufacture. To this company the committee recommended a premium for the best display.

Mr. James Miller, of St. Louis, has on exhibition a new patent (May, 1865,) hot air grate, which heats two rooms at the same time with only one fire. The grate is made with cast-iron tubes, which generate heat, and through tubes attached convey the heat to an upper room; a cavity admits cold pure air into the tubes, which when heated escapes through a larger tube to the upper room. It is undoubtedly an economical invention. All who witnessed its operation, in the open air, where a chimney had been built for it, were struck with the practicability of the contrivance. To it the committee awarded a premium, a diploma.

Mr. Miller's address is Normandy postoffice, St. Louis county. For sale by J. W. Bird; also, by B. Horton, St. Louis.



MILLER'S HOT AIR GRATE.

By the use of this grate, heat sufficient to warm two rooms is obtained from one fire. It is a substantial structure, weighing from 210 to 240 pounds, and throws 30 inches of air, heated from 200° to 240° F. It is believed to be durable from the fact that cast-iron pipes ⅜ of an inch in thickness are used to form the back, one segment of which comes in contact with the fire, while the heat is diffused around the circle with a rapid current of air constantly passing through the tubes. A set of pipes in use for three years show no more effect from the fire than the bars in front of the grate. A small collar for each pipe (projecting ⅜ of an inch on the jambs) receives the pipe, cored out to fit with the use of cement, forms a perfect protection from gas or smoke.

No. 8—CARPENTERS' WORK AND MATERIAL.

For Rim Lock.—W. Corbett and Wm. Burns were awarded a diploma.

For Show Cases.—To Holthaus & Bro., of St. Louis, the premium, a diploma and $20, was awarded.

For Moldings.—J. O'Brien, St. Louis, received the premium, a diploma and $10. They were made by J. S. Collins, of St. Louis.

For Patterns.—The premium, a diploma and $10, was awarded to R. H. Vinoon, of St. Louis.

To W. H. Cutter, for "best vice," recommended as "good workmanship" by the committee, a diploma was awarded.

For Model of St. Louis Courthouse.—A diploma was recommended to Bernard Fenn, of St. Louis, the constructor.

No. 9—FURNITURE.

The display of furniture was very fine. It would have done honor to the palace of the czars. The largest dealers in St. Louis vied with each other. Rich and elegant sets were here in such profusion that the most fastidious taste could not fail to be suited. More extravagant and costly could no where be exhibited. It was a beautiful

adornment to the mechanical hall, and was the admiration of every visitor.

The elaborately and tastefully carved solid rosewood bureau, surmounted by a large mirror, exhibited and manufactured by R. & W. Mitchell, of St. Louis, was awarded the first premium, a diploma and $10.

To the same gentlemen was awarded the several premiums as follows: For a solid rosewood "parlor set," highly ornamented and covered with silk and satin brocatelle, of superb finish, the first premium; for parlor chairs, sofa, sofa bedstead, oiled walnut extension table, center table, ladies' mahogany work-stand, of like finished workmanship as the above, the first premium, a diploma and $10 for each, respectively; also, the first premium, a diploma and $10, for a solid rosewood bed-room set; also, the first premium for strong, tastefully constructed kitchen chairs. The same firm received several premiums in this class at the fair of 1860, the one preceding this.

To Conrades Logeman was awarded the premium, a diploma and $5, for plain chairs for office.

The judges were A. B. Sluder, G. Conzelman, and Nathan Colman.

They awarded the following further premiums in this class:

To R. & W. Mitchell, the first premium, for a large and magnificently finished oiled walnut sideboard; also, the first premium for a handsomely designed and finely finished bedstead.

To J. Clifford, St. Louis, the premium, a diploma and $20, for the best and most handsomely designed and elegant "book-case." It evinced great mechanical skill.

For a beautifully designed and splendidly finished "ladies' work box," complete to the minutest particular, L. Stifel, St. Louis, was awarded the premium.

For a "chandelier," made entirely of cigars, unique and handsome in appearance, ingenious in design, requiring skill and patience in the making, the committee awarded a premium to the designer, John H. Meyer, corner of Fifth and O'Fallon streets. It was elaborately constructed and highly ornamented.

To Warne, Cheever & Co., was awarded the premium for an improved "refrigerator."

School Desk.—Manufactured by Wm. Marlow, of St. Louis, a diploma was awarded. They were well designed and admirably adapted for the purpose for which they are intended.

No. 10.—Vehicles.

Carriages, best display.—To the display offered by Wesley Fallon, of St. Louis, which superb exhibition consisted of elegantly mounted and finely finished family carriages of the latest and most approved styles, either for one or two horses; of buggies, which seemed to be put together with the exactitude of watch work, which were easily set in motion by the weight of the finger, of exact proportions and com

posed of the most approved material, five awards were made for the best display of carriages. a diploma and $20; for the best display of buggies, a diploma and $20; for the best two horse carriage, a diploma and $10; for the best one or two horse carriage, a diploma and $10; for the best top buggy, a diploma and $10.

To Messrs. Freeman & Green, northeast corner of Fifteenth and Chesnut streets, the premium, a diploma and $10, was awarded, for an open top buggy of superior material, style, construction and workmanship.

For the best four horse omnibus and for the best four horse express or baggage wagon, each a private premium of $100 offered by Messrs. Mitchell, Miltenberger & Tansey, Mr. A. Wright, of St. Louis, was the fortunate competitor. They were beautiful in painting, elegant in finish, and thorough in workmanship.

To the same gentleman was awarded the premium, a diploma and $10, for the best omnibus; also, a like premium for the "best express wagon or omnibus spokes." The two latter premiums were offered by the association.

To witness the display of the above named articles, manufactured here at home by our native mechanics, has the effect to persuade one that we will not much longer be tribute to the east for fine and thorough workmanship, either in style, durability or finish.

Messrs. Barney, Ocobock & Co., of Sandusky, Ohio, received an extra premium, a diploma, for carriage seats. The Archimedian axle company, of New York, also, an extra premium for carriage axles. They were represented by Messrs. Barrow & Warren, of St. Louis.

Messrs. T. & H. Smith & Co., of Pekin, Illinois, represented by Barnum & Bro., received the extra premium for a strong, heavy, yet handsome, well proportioned and easy running plantation wagon.

For buggy wheel, finish plain, J. B. Stewart, of Fort Duquoin, Illinois, received the premium, a diploma and $10.

The excellent buggy spokes of Messrs. Barrows & Warren, of St. Louis, received the premium, a diploma and $10. St. Louis carried off the premium for the same articles at the last fair.

The committee were Messrs. Bell, Edgar and Holmes.

No. 11.

To the Laflin powder company, of St. Louis, for their display of powder for guns, which was very excellent, the committee awarded a diploma.

The committee were Messrs. S. C. Hunt, A. Paul and J. T. Sweringen.

No. 12.—Fountains, Pumps, etc.

Among the numerous entries for this useful and now much improved article—a well pump—the St. Louis railway supply company

were the fortunate competitors, and received a diploma. It was manufactured by Cowing & Co., of Seneca Falls, New York.

For cistern pump, L. M. Rumsey & Co., of St. Louis, took the diploma and $10. They made a grand display of syphons, pumps, patterns for hydraulic rams, etc.

The anti-freezing hydrant, which is durable and easy of repair, and prevents waste, belonging to Joseph P. Gallagher, 211 North Fifth street, was adjudged worthy of a diploma.

The hydraulic ram of Joseph Ryan, of St. Louis, was deemed worthy of "special notice."

The committee were Messrs. W. H. Thompson, William Simpson, and T. D. Turner.

No. 13.—Coopers' Ware.

The acting committee in this subdivision, Messrs. E. W. Ware and E. O. English, adjudged a diploma to the strong and tight barrels for flour, manufactured by Henry Weigel, of St. Louis.

No. 14.—Shoemakers' Work and Implements.

Boots, gents' dress, summer	Diploma and $10
Boots, gents' dress, winter	Diploma and 10
Slippers, gents	Diploma
Slippers, ladies'	Diploma and 5

The four above enumerated premiums were awarded S. F. Thayer, No. 112 North Fourth street. There articles, as well as others which he exhibited, were tasty and elegant, and attracted their due proportion of attention; also, a diploma for ladies' summer gaiters was awarded him.

The acting awarding committee of No. 14 were Messrs. C. R. Stinde, C. Shumacher, and George S. Drake.

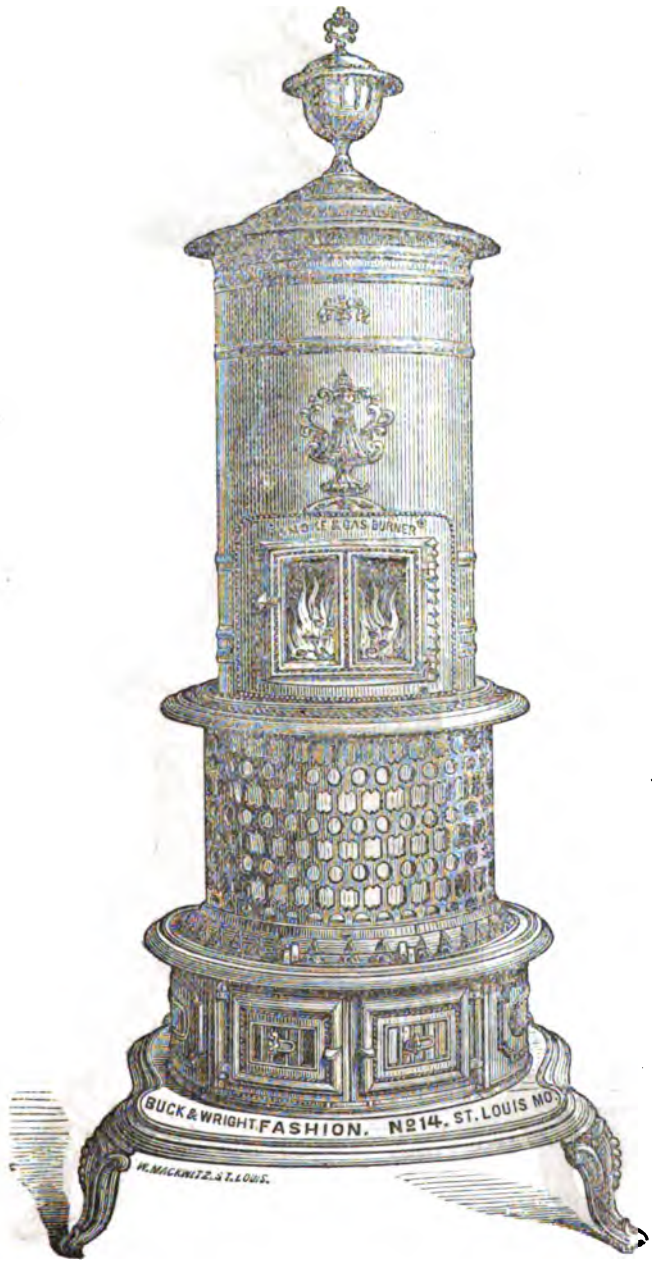
No. 15—Trunkmakers.

Trunks, traveling	Diploma and $10
Ladies' traveling trunk	Diploma and 10
Ladies' satchel	Diploma.
Valises	Diploma.

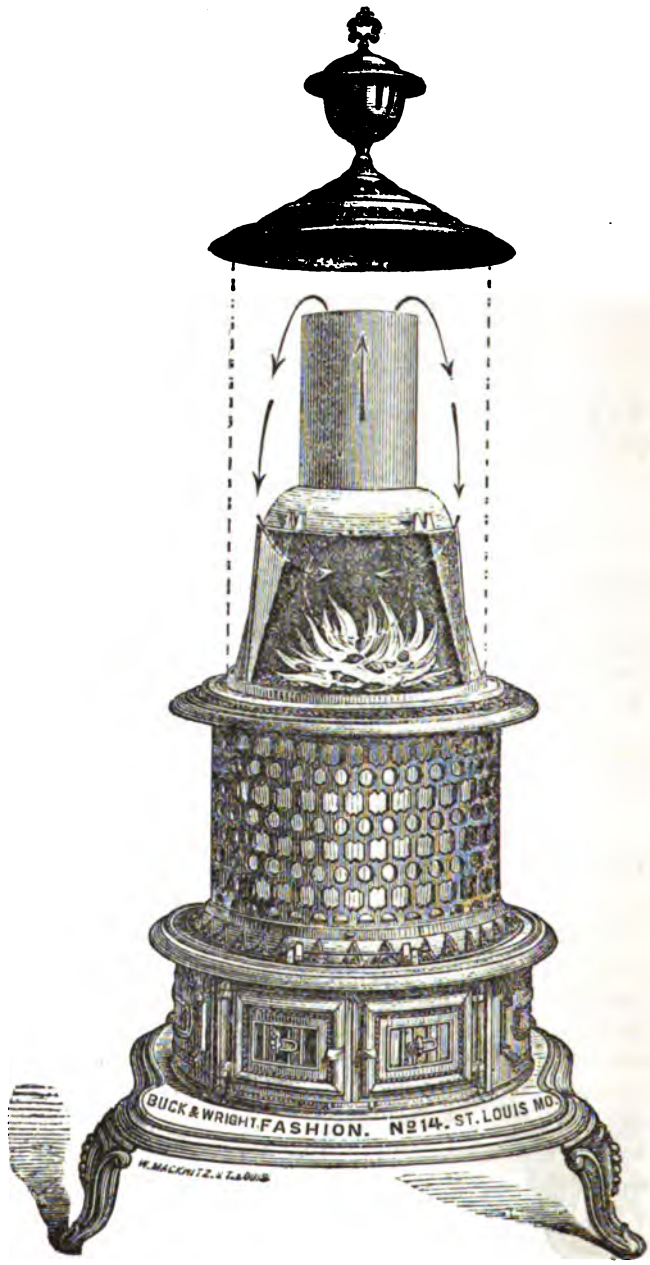
Messrs. Murphy & Fallon, No. 223 North Third street, were awarded the four above mentioned premiums. Their collection was full and complete; it consisted of tastefully and elegantly ornamented trunks, of valises, carpet bags, and of everything else in that line. The workmanship on all these articles was of the very best.

For the private premium for the best sole leather trunk, $50, Messrs. Ticknor & Co., corner of Fourth and Washington avenue, were the fortunate competitors.

The committee were D. A. Dixon, John J. Grimsley, and John P. Myers.



BUCK & WRIGHT'S PATENT STOVE. (See p. 549.)



BUCK & WRIGHT'S PATENT STOVE. (See p. 549.)

No. 16—Saddlery, etc.

There was a fair exhibit of harness and saddles, but not as large as should be; those, however, on exhibition were of the finest material and manufactured in the best and most durable style. To P. J. Peters, St. Louis, was awarded the first premium for gents' saddles, a diploma and $10. It was tastefully made.

Messrs. Rothan, Straus & Bro. obtained one of the special premiums offered by Messrs. Peterson, Hanthorn & Co., of St. Louis; it was $50, and for the best man's saddle made on a hide-covered Natchez or El Passo tree, full trimmed, with stirrups, girth, etc., complete; it was pronounced well made in every particular.

The private premium offered by Messrs. Peterson, Hanthorn & Co., for the best set of light double harness, not to weigh over twenty-five pounds, $100. This liberal premium was awarded the very handsome and highly finished set exhibited by E. H. Schollmyer. To attempt to describe them would be ridiculous excess; they were as neat and elegant as could possibly be.

The side saddle, manufactured by Mr. Ira Stansberry, out of skirting leather, with raised stamping, was the only one on exhibition; it was pronounced by the committee "a good job."

To A. F. Hammel & Son was decreed the regular premium of the association, a diploma and $10, for the best gent's saddle and bridle.

The St. Louis stamping company got the first premium for German silver saddle mountings.

George T. Cline obtained the premium for the best machine for forming horse collars.

PRIVATE PREMIUMS OFFERED BY E. G. OBEAR, ESQ.

Best Single Buggy Harness, $25.—E. A. Corbet took the reward with a beautiful set, the workmanship on which was highly ornate and well executed. To him was awarded, also, the regular premium, a diploma and $10, for the best set of double buggy harness; also, the premium, a diploma and $15, for the best harness for carriage.

To E. H. Schollmyer was awarded the premium, a diploma and $10, for the best single harness of buggy; the style was plain, but the workmanship was very fine.

To J. F. Schiefer, of Hover, Calhoun county, New York, was awarded a like premium for single harness for buggy.

Collars.—Pair for coach horses, diploma and $5. This premium was awarded L. Deming of St. Louis.

For the best harness for pair coach horses, a like premium was awarded C. Helbig, of St. Louis.

Saddletrees, Spanish, ass't..... ..... Diploma and $5

" American or English, ass't..... Diploma and 5

This was decreed McCrory & Schweke, of St. Louis. L. & G. Wolmar, of St. Louis, got the premium, a diploma, for hair girts.

The committee were Messrs. D. A. Dixon, John J. Grimsley, and John P. Weyers.

No. 17.—Hats, Caps, etc.

Hats and caps, best display	Diploma and $20
Hats, silk	Diploma and 10
Hats, fur or felt	Diploma and 5
Caps, fur	Diploma and 5
Caps, cloth	Diploma and 5
Umbrellas	Diploma

The display made in these articles was very fine, and in finish, style, quantity and quality, rivaled any of the other magnificent displays in the subdivisions of this class. To Messrs Lewis & Groshon, of St. Louis, was decreed the first award, as well as the four other awards above enumerated. The most fastidious taste would have been pleased by them.

The judges were Messrs. George W. West, George N. Alexander, E. A. Corbet, and D. K. Smucker.

No. 18.—Guns, Pistols, and Fishing Tackle.

Fire-arms and apparatus, best display, a diploma and $10. To the display of R. Beauvais of St. Louis, this premium was decreed. It consisted in a large and splendid assortment of handsomely chased and highly ornamented guns, pistols, flasks and cartridges, that would be difficult to excel in style and finish.

This gentleman likewise received the premiums for a fine looking rifle and handsome shotgun, either of which would be the pride of a sportsman to handle, and which reflected great credit to the artisan that fashioned them.

Mr. R. Beauvais exhibited every variety of floating and fishing tackle—every contrivance in fact, that is used by man to force or allure the fish from his native home, to show the tempting bait, but to conceal the fatal hook. To him was awarded the premium for the best display.

To the animal trap of G. W. Pagett, Indianola, Iowa, exhibited by Clark, Killian & Co., of St. Louis, a diploma was recommended. The "varmint," rat, mink or weasel enters from one apartment to the other, where dainties are invitingly spread before him; in each instance the door has mysteriously closed behind him, and, too late, without knowing why or wherefore, he finds himself a prisoner, and that exit is debarred him.

The committee were Messrs. J. T. Sweringen, Sherry C. Hunt, and A. Paul.

No. 19.—Curriers.

Leather.—Best display, diploma and $25. Philip Newfang, of St.

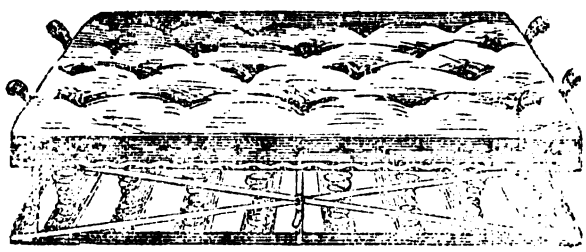
Louis, made a handsome display of morocco, and other skins, that were exceedingly well dressed, and to him was awarded this premium and also a diploma, for the best dozen of sheep-skin linings.

For hemp belting, John Campbell, of St. Louis, got the first premium.

Committee, Messrs. W. P. Hanthorn and E. A. Corbet.

No. 20.—Upholsterers' Articles.

Matresses (curled hair).—To a fine exhibition of this kind of mattress, made by R. & W. Mitchell, St. Louis, the premium was awarded, a diploma and $10, and to the same gentlemen a diploma for spring matresses.



R. & W. Mitchell's Spring Matress.

Committee, Messrs. A. B. Sluder, G. Conzelman, and Nathan Colman.

No. 21.—Willow and Wooden Ware.

Willow Ware.—St. Louis manufacture, best display, diploma and $20. The exhibition of C. A. Stolz, South Fifth street, which consisted in a large quantity and variety of rocking and other chairs, racks, baskets, and other articles of willow ware, reflected much credit to the genius of the party that contrived the different designs, and to the skill of the party who executed the work.

The fine display of willow ware, exhibited by Ernest Beme, was deemed worthy of special notice.

For the best display of cedar and cypress ware, the full and choice display of Jacob Tamm, which consisted of pails, tubs, and churns, bound with iron and brass, and every variety of articles made of this wood, the premium, a diploma and $20, was adjudged. To the same gentleman the premium, a diploma, was awarded for pine ware, which was as complete and creditable in variety and finish as the foregoing.

The committee were J. P. Bell and E. A. Corbet.

No. 23.—Scales, Vaults, Locks, etc.

Hay and cattle scales	Diploma and $10
Platform scales	Diploma and 10

The above named premiums were awarded Messrs. Pratt & Fox, for the celebrated Fairbank's scales, whose superiority and fame are too well known to need an extended description or notice here.

To the same gentlemen was awarded the premium, a diploma and $20, for S. C. Herring's fire-proof safes.

For bank locks, the premium, a diploma, was awarded T. A. Noyes, No. 113 Washington avenue, for the lock of James Sargent, of Rochester, New York.

The committee were Messrs. Frank W. Roberts, Charles Bœrcker, and B. R. Bonner.

To Messrs. Warne, Cheever & Co., who had on exhibition a splendid display of table and fine cutlery, in almost endless variety, as well as a large and handsomely finished variety of edge tools of almost every description, the following premiums were awarded: For the best display of edge tools, those of G. J. Teneyck & Co., Cohoes, New York, a diploma and $10; for the best display of cutlery of all kinds, a diploma and $10; for the best set of knives and forks for table use, a diploma; for the best display of pocket knives, a diploma; for the best assortment of scissors, a diploma; for the best axes, those of Weed, Becker & Co., Cohoes, New York, a diploma; for the adzes of the same firm, a diploma; for the best drawing knives, those of Bradley, Westport, Connecticut, a diploma.

The committee were W. C. Defries, R. Beauvais, and C. O. Gaines.

No. 25.—Model for Steamboat.

To the model steamboat, constructed on a scale of one-fourth of an inch to the foot, five feet long, ten inches in the beams, and two in the hold, the Western, perfectly arranged in all her parts, even to the jaunty red, white and blue floating from her flag staff, built by the patient ingenuity of Walter Brindle, a talented, persevering and worthy young ship carpenter, the premium, a diploma and $10, was awarded.

To the model dry docks, exhibited by Joseph Ryan, a premium was decreed.

For model bark canoe, Alexander John Thompson obtained the premium, and for portable sporting boats W. E. Bond, of Cleveland, Ohio, obtained the premium.

The committee were Messrs. Sherry C. Hunt, R. McIlvain, and James Ward.

No. 26.

Sewing Machines.—First premium, diploma and $25; second premium, large bronze medal.

In a deep woody copse, a little distance from the amphitheatre, a little round house, neatly carpeted, and open on all sides, so that a fair view could be had of what was passing within, overhung with honeysuckles and jessamines, was dedicated by the association to the

exclusive use of these machines. There sat several pretty girls in the midst of the animating scene—for of the thousands round about, some were strolling over the green, some were carousing at the booths, and all seeking diversion in some way—earnestly at work on their respective machines, which were responding with a busy hum to the pressure of their little feet that peeped out like so many mice from beneath their dresses. They paused only to exhibit their work or to descant on the merits of their machines to the inquirer. All the choice inventions of our country were there. The public are acquainted with the respective merits of these machines; each one has merits peculiar to itself.

The first premium was awarded to the Wheeler & Wilson machine, represented by A. Sumner; the second premium to the Singer machine, represented by Edwin Dean, 312 North Fourth street.

For Knitting Machines.—Diploma and $20. The Lamb knitting machine manufacturing company, of Rochester, New York, was the fortunate competitor for the first premium. It is represented by Clark & Leet, No. 103 North Fifth street, St. Louis.

For fixtures for sewing machines, Wilcox & Gibbs, of New York, were recommended a diploma.

The committee were George W. West, D. R. Smucker, E. A. Corbet, and George W. Alexander.

No. 27.—PAINTING, GRAINING, ETC., ON WOOD.

For the Best Ornamental Painting on Glass.—Koenig & Knobel, No. 121 Chesnut street, were awarded the first premium.

To Shaw & Hoffman was awarded the second premium for sign painting.

The committee were Messrs. James Spore, R. R. Bonner, and James Tarlton.

No. 28.—GLASS, CROCKERY, STONEWARE, ETC—MISSOURI MANUFACTURE.

For the superb display of stained glass, made by Adolph Sutter, No. 303 Locust street, the first premium, a diploma and $10, was awarded.

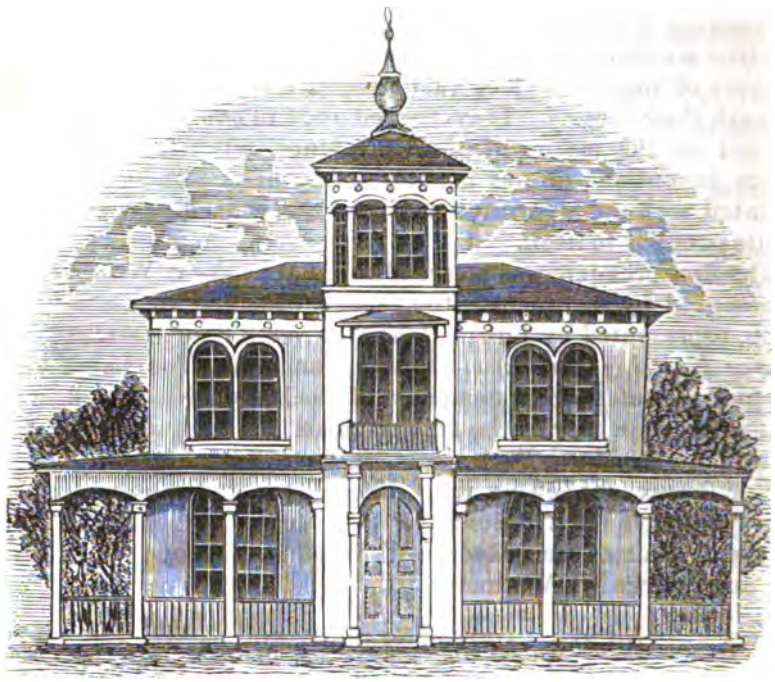
The premium, a diploma and $10, was awarded the plaster glass company for flint glass.

Messrs. J. Braun & Co. were adjudged the premium, a diploma and $10, for terra-cotta ware.

Tiles.—For a fine display, made by H. M. Thompson & Co., of St. Louis, the award, a diploma and $10, was made. To the same gentlemen a like award, a diploma and $10, was made for stone or earthenware pipes. For this latter article they received a special notice and a certificate at the previous fair.

For Plastic Slate Roofing.—Chilion B. Allen, northeast corner Olive and Third streets was decreed the first premium. It is manu-

factured ground fragments of slate, mixed with coal oil. It is claimed that it is durable and cheaper than ordinary roofing.



The above cut represents a country residence covered with the celebrated plastic slate roofing which was on exhibition at the St. Louis fair, by Chilion B. Allen, of 513 Olive street, St. Louis, and received the first premium and diploma. The process of reconstructing slate stone from a disintegrated state was patented February 21, 1865. It is a combination of pulverized slate and viscous matter (the latter possessing qualities of geological and chemical affinity for the former) and is a development of one of the simple but unalterable tendencies of nature. As a roofing material it stands unrivaled. A mastic—it adapts itself to every shape and slope. Non-combustible, impervious, non-expansive, and undecaying. Frost does not crack nor heat dissolve it. The only roofing material ever discovered that will resist the action of the elements as long as the structure it protects. Being susceptible of little if any wear, from exposure, and perfectly fire proof, it is unequaled as a coating for railroad and farm buildings, fences, bridges, bottoms of vessels, vaults, etc.

To Messrs. Beers, Judson & Beers, of New York, a diploma was awarded for an excellent improvement—a cone and globe for lamps. It is of glass, and is said to save 20 or 25 per cent.

The committee were Messrs. Charles G. Wells, James W. Wallace, and Chas. Miller.

No. 29—Bricks, Stone, etc.

For Stock Brick.—Henry Bushkamper, of St. Louis, received a diploma, and also a similar award for paving brick.

Grindstones—For a fine specimen of this article, Messrs. Sterns & Frazee, of St. Louis, obtained a diploma.

Lime (not less than 5 bush.)—For a superior article exhibited by T.

Weiner, of Carondelet, Mo., the premium, a diploma and $10, was awarded.

Concrete stone, exhibited by the Missouri concrete stone company, of St. Louis, was thus spoken of by the committee: "most highly recommended as a splendid invention and worthy of a premium."

Best Specimen of Apprentice Workmanship.—For a "wheel" made of seventy-eight pieces, R. H. Moon, of St. Louis, was decreed the premium, $25.

The feature of the hall that most attracted the attention of the idlers at least, was a "shooting gallery" placed on exhibition by Joseph Sent, of Carondelet avenue. The gallery is so constructed that whenever the marksman makes a centre shot out stalks a stately officer, followed by a company in military uniform, with regular military step, and when all are in full view they salute the lucky shooter with a "present arms," and then facing about, shoulder arms and march off in the opposite direction from whence they came. They are followed by a stout damsel, who, we are inclined to believe, is "the daughter of the regiment." This ingenious piece of mechanism was much admired, and drew a constant crowd around it.

Class D.

PRODUCTS OF FIELD AND GARDEN FOOD, ETC.

FRANCIS WHITTAKER, *Superintendent.*

We turn from the busy city, from machinery and manufactories, which man made, to view the country—or rather the products of the country—made by God.

We see the earth, clothed as it were in a magnificent garment, full of beauty, full of bounty and wealth; we see the budding trees, the fresh garden, the newly-tilled fallow, the narrow path in the vineyard, and the purple clusters.

We see the bountiful house-wife, nature, spread fruits and vegetables and flowers before ungrateful man. We think of the Psalmist, when he exclaims—"O all ye green things upon the earth! bless ye the Lord; praise Him and magnify Him forever."

The mind flies to the green country, with its healthful purity and living beauty, or it wanders beyond to the valleys, the trees, the mountains and rivulets; it forgets the strife of passion, the pageantry of vanity, personal ambitions and emulations, the fever of commercial speculation, the ever recurring political controversies; it hears the birds, sees the flowers, feels the fresh breezes, tastes of the cool springs—and for a moment, with the thronging multitudes around us, we are lost in contemplation in viewing the abundance, beauty and sweetness of the rural world here spread before us.

The awards were as follows:

Best Collection of Seed (not less than fifty samples, open for United States).—Several of the largest seed stores in St. Louis contended for the twenty dollar premium offered on this occasion; and the display of seed comprised every variety of seed used for agricultural, horticultural, and nursery purposes. The premium, $20, was awarded to the exhibition made by Messrs. Barnum & Bro., of St. Louis. The selection of seed is of prime importance in the raising of every species of crop, and a matter to which too much attention cannot be given.

The awarding committee were Messrs. Henry Michel, Jno. N. A. Beutzen, and H. Krögermeyer.

For the Largest and Best Collection of Irish Potatoes, in half bush basket.—Many competitors entered the lists to compete for the premium offered for this favorite vegetable. The lots were all choice. Where can better Irish potatoes be than those of the Mississippi valley? and we have many spots in Missouri peculiarly fitted for the raising of them. Of the several superb specimens exhibited, the basket of Maj. E. D. Cozzens, of Jefferson county, Mo., was the favorite.

To him was awarded the premium, $10, for the best lot of potatoes for table use.

For the best one bushel of sweet potatoes, with written statement of the mode of cultivation, the lot of splendid large ones exhibited by Eliza C. Tebbe, of St. Louis county, received the award, $10. We have not seen the statement of the manner of their cultivation; but when planted in a hot bed during the first 10 days of March, then transplanted about the middle of May, and afterward the hills kept free of weeds, they attain a monstrous size. Many localities in the vicinity of St. Louis are well adapted for the cultivation of them.

Irish Potatoes (best and greatest variety, in samples of half peck each).—Messrs. Plant & Bro., of St. Louis, obtained the award. Well was it merited; it embraced almost every variety of potatoe: red, white and blue neshannock, white and yellow pinkeye, fluke, Irish gray, Jersey blue, peach blossom, black kidney, and, I might say, almost a hundred other different varieties. The assortment was elegant, and in it our native varieties, some of which are very fine, were not forgotten.

FOR THE BEST AND LARGEST COLLECTION OF GARDEN VEGETABLES FOR TABLE USE, EXCLUSIVE OF POTATOES.

Garden Vegetables (largest and best collection, for table).—The display of vegetables under this heading was very fine. They consisted only of those vegetables which mature under autumn skies, and, consequently, did not form a large variety There were turnips, beets, cabbages, pumpkins, and the like vegetables, and all as large, fresh and well-matured as we ever saw. To encourage the raising of vegetables, which our generous soil and mild climate is particularly favorable to, the association offered the premium of $20. Eliza C. Tebbe, of St. Louis county, won the award; U. F. W. Beutzen & Sons, of St. Louis, the second, $10. At each successive fair finer and finer vegetables are shown, a sign that the manner of cultivating them is improving. How much is owing to the efforts of the association?

Best Pumpkins or South Sea Squashes.—This award, the premium, $5, was decreed to Major J. E. D. Cozzens, of Jefferson county, Mo. The samples were not so large as at some of the previous fairs, but were large enough for all practical purposes, and the exhibition was very creditable.

Best 12 *Stalks of Celery.*—To the fine stalks exhibited by Mrs. Eliza C. Tebbe the award, $10, was made. They were well bleached, delicate and tender.

Best 12 *Stalks of Rhubarb.*—The entries were all superior, but to U. F. W. Beutzen & Sons, of St. Louis, was adjudged the premium, $5.

Best 12 *Head of Cabbage.*—To T. R. H. Smith, of St. Louis county, for the fine collection of this article exhibited by him, was awarded the premium, $5.

Best Collection of Beets.—A more superior exhibition of beets it would be difficult to find anywhere. Some were of extraordinary size. Eliza C. Tebbe took the prize, $5. She also won the premium for similar vegetables at the previous fair.

For the best bushel of corn, which was indeed superior, Major J. E. D. Cozzens gained the premium, $5.

PRIVATE PREMIUM BY THE PROPRIETORS OF THE LINDELL HOTEL.

Best and Largest Collection of Garden Vegetables, $15; *best 25 Stalks of Celery* (open to all), $20.—This contest was lively. There were several competitors. All kinds of vegetables of the autumnal season, that delight the sight, smell or taste, decked in vegetable gold, were there. To Mrs. Eliza C. Tebbe were awarded both the above premiums. To the same lady was awarded the private premiums, offered by the proprietors of the Southern hotel, for the best and largest collection of garden vegetables, $20; for the best twelve stalks of celery, raised in Missouri, $20.

The committee were Messrs. Alfred Plant, Henry S. Reed, and Wm. F. Stacey.

Best Barrel of Flour (to be taken from a graining of not less than fifty barrels).—There were ten entries, and each sample examined was of superior quality; all were very fine. The name of the owner, nor the barrel from which the sample was taken, could not be known to the judges. The award, a diploma and $10, was made to the Cape City mill, of Cape Girardeau, Mo., represented by Messrs. Hanshen & Orthwein, of St. Louis.

Lager Beer—For which invention the world owes the merry old King Gambrinus a large debt of gratitude, which is rapidly becoming a popular beverage throughout America, to which a large portion of our inhabitants attribute much virtue, and from which they gain a great deal of "gemüthlichkeit" and genuine comfort, and for the manufacture of which St. Louis is justly celebrated, and is now exporting large quantities to all parts of the Union, the premium, a diploma and $20, was won by Messrs. Kuntz & Hoffmeister.

The second premium, $10, was awarded Julius Winkelmeyer. Mr. Winkelmeyer's beer took the first premium at the previous fair.

Messrs. B. F. Young & Co., of St. Louis, exhibited a prime article of ale, and with it took the premium, a diploma and $20.

No. 7.—TOBACCO—MISSOURI MANUFACTURE.

The exhibition of tobacco, one of the staples of Missouri, was choice and extensive, and of the most superior quality. Competitors came from all parts of this state, and from Illinois and Kentucky.

Best Hard-Pressed Tobacco, 50 pounds.—In this class, or subdivision of a class, the entries of Messrs. J. B. S. Lemoine, White and Erickson, and another whose name we did not learn, were rejected from

competition, although the committee admitted them to be "of very fine quality and workmanship," in consequence of being "soft-pressed."

To James Roddy, of St. Louis, was awarded the premium, a diploma and $20.

For Best Hard-Pressed Nat. Leaf, 50 pounds.—Messrs. Lewis & Bro., of St. Louis, were awarded the premium, a diploma and $10.

Best Box of Cigars of any kind of Tobacco.—This premium, a diploma and $10, was decreed Messrs. Fisher & Ascheman, of St. Louis.

The committee on tobacco, Messrs. Wm. L. Austin, Jos. S. Nanson and John N. Booth, reported the following: "If consistent with the principles of the association, we recommend the association to award a diploma to Messrs. Turner, Van Horn & Co., Quincy, Illinois, for remarkably fine samples exhibited by them of hard-pressed tobacco and natural leaf tobacco made from Missouri leaf, purchased by them in this market. We also recommend diplomas to be awarded for best fine cut chewing tobacco, for which no provisions has been made. This is a very important interest in this city and state, and is peculiarly deserving the fostering care of the association. The above remarks also apply to fine cut smoking tobacco and snuff."

In accordance with the foregoing recommendation, the following awards were made:

For the best fine cut chewing tobacco, Messrs. Pearce, Slicer & Co., of St. Louis, received a diploma; also, a diploma for the best fine cut smoking tobacco.

For the best snuff, a diploma was awarded Jacob Moreshel, of St. Louis.

The private premium by Mr. Russell, successor of Edward Mead & Co., corner Fifth and Olive, for the best bale of cotton raised in Missouri or Illinois, was awarded Mr. Charles Fink, of New Madrid county, Missouri. The committee remarked: "It is short staple, and would class low middling."

The committee further remarked: "We have just received a specimen bag from Mr. J. E. D. Cozzens, which we think a good article, but on account of the premium being only given for the 'best bale,' no premium could be awarded him. We think his sample highly creditable to the state of Missouri."

This seems to presage with certainty that the time will come when cotton, which once was "king"—but not now the less esteemed on account of his dethronement—will be extensively cultivated in Missouri.

For a choice article of hand-made hemp rope, Messrs. T. & J. Sullivan, St. Louis, received the premium, $20. It was one coil from not less then fifty coils.

For some unaccountable reason, our great staple, hemp, was but feebly represented.

The committee were Messrs. W. J. Lewis and Walter C. Carr.

We now approach those articles in which the ladies were in part or in whole the competitors. Why is it that the American, eminently practical in other respects, is so unpractical in the education of his daughters? They are sent to a French school, learn snatches of Italian, German and French operas, how to enter a parlor, but would swoon at the thought of entering the kitchen, and would die of "ennui" on attending to houshold duties; yet this same girl may marry a young man, who has been cast upon his own resources at an early age, and who carries about him the "disease of all shunned poverty" —who is poor, and upon whom "proud worth looks down and honor shuts the door." What's to be done, then? Her education must begin anew.

If she be a true woman, her love will remain untainted. She will consider her duty, will consider the duties that environ her husband; she will soften them by her love and true obedience; she will give up empty accomplishments, quit the frivolous and giddy circle of fashionable life; will study economy, will learn household accomplishments—aye! she will learn to bake, preserve and pickle. In these wife-like accomplishments she will be full of tenderness, "in meekness, saint-like"—will fill her home full of comforts, and will make home happy. Such a wife can hang about her husband's neck a life time and never lose her lustre.

No. 6—Bread, Cakes, and Confectionery.

Best Wheat Bread, 4 loaves, home-made, $5.—That entered in the name of A. Kimmel, corner Chouteau avenue and Missouri streets, was, of all the exhibits, accounted the best, and received the premium, $5. Everybody knows what good bread is; how hard to find at hotels and at other places; how difficult it sometimes is to get it at home—this was good.

For rich, nicely made, and finely baked fruit cake, Mrs. C. W. Spalding, of St. Louis, was the one to whom, or whose favor, the much coveted award was made.

The premium for pound cake was decreed Mrs. Mary Jane Berry. To say that it was nice would be superfluous; all know that it must have been very nice.

For very light, well baked, and elegantly tasted sponge cake, Miss Joe Guyer, of Kirkwood, received the premium.

The ornamental confectionery, entered in the name of L. Fuerst, of St. Louis, was very handsome, and was decreed a favorable notice.

For macaroni the premium was adjudged to L. Pettaluga, corner Ninth and Walnut streets; also, to the same, the premium for vermicelli.

The committee were Messrs. John Farrell, Charles Holmes, and Fred. Maurer.

The premium fresh butter, presented Mrs. T. G. Settle, of St. Louis county, might have been set before the most celebrated doctor of Sar-

bonne. The dressed carcase of mutton, which obtained the $30 private premium of the Lindell hotel, awarded Charles Zöller, would have done honor to the "Trois Frires Provanceau," while the premium preserved grapes of Mrs. D. T. Jewett; the premium preserved quinces of Mrs. Dr. Peebles, of St. Louis county, and of Mrs. E. J. Halstead, of St. Clair county, Illinois; and the premium peach butter of Miss F. B. Xaupi, of St. Louis, and the tomato butter of Mrs. D. T. Jewett, of the same city, would have graced the table of a king. Here were, also, the premium home-made molasses of Mrs. John Thiernan, and the premium honey of Mr. Rufus Ricketts, making, altogether, such a display as would have made the mouth of an anchorite water, or as would have stimulated the appetite of a viceroy.

For a fine article of Chinese sorgum sugar, the Orvis sugar company of St. Louis, was awarded the first premium, $5; John Thiernan, of St. Louis, the second, $2.

Private Premiums by the Southern Hotel.—Best apple butter, not less than one gallon, $10; best five pounds of honey, with written statement of the treatment of hives and bees, $15.

The above premiums were awarded as follows: For apple butter, the first to R. S. Reed, St. Clair county, Illinois; second, to Mrs. O. L. Burdick, of St. Ferdinand township, St. Louis county; for honey, to Mr. Rufus Ricketts.

Private Premiums by the Southern Hotel.—Best twenty-five pounds of fresh butter, Missouri make, $25. Mrs. F. Price, of St. Louis county, Missouri, gained the award.

To R. L. Sutplin & Co., New Milford, Pennsylvania, was awarded $10 by the association for the best twenty pounds of May butter; and to D. W. Morse, Tunnel station, Jefferson county, Missouri, the first premium and $5; and to Mrs. E. J. Halstead, St. Clair county, Illinois, the second premium, $2, for the best preserved peaches in cans or jars.

Wine—now extensively cultivated in our state, at Hermann and other points; in St. Louis county, where an American wine company has been organized; at Nauvoo and Warsaw, in Illinois; at Fort Madison and Burlington, in Iowa, and at other points in these and the adjacent states—which, in all countries and at all times, has been accounted the "merry cheerer of the heart," whose virtues have been sung from time immemorial by poets, and which will do more for temperance than "Maine liquor law" restrictions; which will banish "red eye" and "spurious brandy"—was also represented at the great fair of 1866; however, in not as large a number of varieties as should have been expected.

Best collection of native wines, which consisted of all the prominent varieties produced in this state, and which were all excellent, were exhibited by Mr. George Husmann, of Hermann, Missouri, who received the diploma, and we are inclined to believe that even the austere Father Mathew, looking upon each variety as it "sparkled in

the cup," might have been tempted to abandon, for the time, at least, his favorite idea, and "drink no longer water, but use a little wine for his stomach's sake."

To the Virginia seedling, exhibited by the same gentleman, the premium, $10, was given. It is a favorite wine—it is "red" and "giveth color in the cup," but we did not perceive in it either the bite of the serpent nor the sting of the adder. We readily pronounced it "a good familiar creature," and the award of the committee all right.

To Mr. Husmann was decreed also the premium, $10, for the best wine of any other grape.

The American wine company were decreed the premium, $20, for the best sample, not less than six bottles of Catawba, of the vintage of '64 and '65.

For sparkling Catawba there was no competition, but the committee pronounced it "good wine and deserving of a reward." The committee were Messrs. Jno. T. Zizeman, Geo. L. Stansberry, and Jno. T. Mauntel. When we consider that three hundred years ago there was no good wine in France; that it was even called "execrable" by her historians; that Château Margeaux, Château La Fitte and Johanisberg, are favored spots in wine growing countries; that they have been found out by actual test, that Missouri soil produces a thousand different varieties of wild grape, which may be found overhanging the trees in almost every forest, may we not hope that by time and experience, the very best qualities of wine may be produced in Missouri—even the rivals of those above named? The association will do all she can to test the matter. If science do not err—if truth be in chemistry—Missouri must become the vineyard of America.

Lime, soda, potash, magnesia, phosphoric acid, the component parts of the vine, and of the most celebrated vineyards of France and Germany, are the ingredients of her soil, which is dry, light and elevated. Her climate is mild, her atmosphere vaporless, her water abundant and pure; and it is computed that she has fifteen millions of acres in southern Missouri alone, which is the natural home of the luscious grape.

Class E.

FRUITS AND FLOWERS.

WILLIAM L. EWING, *Superintendent.*

We approach the floral hall, a circular building, fifty feet in hight, and three hundred in circumference, whose exterior presents nothing remarkable or striking. We enter, and as bright a vision as poet ever fancied, or sweet elysian dream ever pictured, is presented to our view. The gentle south breeze comes over a bed of roses and other flowers, stealing and giving odor; a gush of waters falls upon our ear, with an echo faint, sweet and wild; wreaths, arches, swinging baskets and dancing fountains; the stately fig tree, the sago palm, the beautiful canne, auria cania, and the grandiflora magnolia, swell in rounded tufts among other glowing and blossoming shrubs of various hues, and deck like jewels this magical bower, and, with all, gleams of sunlight creep beneath the flowers to make them brighter. The senses awake as if from a pleasant dream. A lovely scene, one of enchanting beauty, is before us. In the center stands the temple of concord, dedicated to the fruit bearing Ceres; it is crowned with all her rich gifts, in fragrance and beauty. The whole embowers a sylvan grotto, around whose entrance hover, among ferns and other variegated plants, zirmeas, larkspurs, pansies, flaxies, Japan lilies, and wonderful passion flowers, roses, dahlias, verbenas, and a thousand other varieties of chaste and beautiful shrubs. To the right of the promenade are tables upon which the cut flowers—baskets of bouquets and rare floral devices—are arranged for competition. Nodding violets, and myriads of other choice flowers, quivering before the view, and dancing in their beds of living green, are there seen arrayed in all their loveliness. All is gorgeous, yet beautifully chaste. In the center of the space rises the temple, whose octagonal portico is supported by eight pillars, around which clamber green vines and odorous flowers, and on whose crests are sheafs of wheat neatly bound with blue bands. The cornices were ornamented with a circle of large squashes; then evergreen; then a row of ears of white corn and evergreen; then a row of yellow ears and evergreen; then red ears and evergreen; thus alternating with bundles of oats, rye, wheat and every kind of staple grain in the sheaf, which crown the summit. Sea shells, amid the budding roses and purple violets, over which floats the star spangled banner, make the scene, as to the temple, complete; thus ornamented, thus screened by the depending vines, whose purple clusters blush to the lovely scene around, formed a "scene" indeed, where a god might cast his sight, and gaze and wonder with delight. Within the grotto are huge moss-covered rocks. From among the moss and ferns, wet and glis-

tening with the water drops from the dancing fountains, their serrated and scoriated surfaces peep out, and with other shrubs guard every approach to the clear crystal lake which they surround. Six elfin fountains spurt their cool streams aloft, to refresh the atmosphere, to extract sweet odors from the surrounding flowers, to give gentle murmurs among the sedges, and, in mazy windings along the rills, to lose themselves among the rocks. Here are shelving and moss-covered rocks, sequestered nooks and fairy bowers, white cliffs and a Sybil's cave.

"The naid murmured in the silver stream,
The Dryad whispered in the nodding wood,
(Her voice the music of the zephyrs breath);
On the wave the sportive Nereid moved
Or blew her conch amidst the echoing rocks."
Here might the fair-haired nymph with every beauty crowned,
Sit and sing and have the rocks resound
Her lays; here might the sad man, by himself apart,
Meditate the sorrows of his swelling heart;
And here gain new life from the balmy power
That stirs and breathes within this verdant bower.

A thousand odorous plants and fragrant flowers were here collected, grouped in wreaths, in bouquets of every size and style, and in festoons, so as to make

"Even the gods who walk the sky,
Amorous of one scented sigh."

The design was that of Mr. Kerne; the decorating plants used by him were chiefly from the summer house of Henry A. Homeyer and the nursery of Henry Michel.

The fruits were not, as on former occasions, displayed in the floral hall, but were assigned a separate apartment.

In the adornment of floral hall much taste was displayed. Many thanks are due those who contributed toward its adornment—to those who formed the tasty designs, and to those who furnished their rare and choice flowers. We regret that space will not permit us to mention them all by name.

N. J. Colman furnished dahlias of all colors, from pure white to dark maroon—also, branches of the snowberry and honeysuckle and dried grasses, unique and beautiful.

Mr. Henry Michel furnished many decorating plants; many came from the Park avenue green houses, and some from Lafayette park.

The floral design, by Henry Michel, to which was awarded the first premium, was both original and beautiful. We fear to attempt a description of it. It was eight feet in hight, and formed of every variety of choice and rare flowers; on the summit of the columns were baskets filled with flowers, transcantia and others; on the pillars were passion flowers. It was much admired.

The following are the premiums awarded:

Floral design, natural flowers, first premium, diploma and $20, to Henry Michel, of St. Louis county.

Large vase and basket of natural flowers, first premium, $10, to Henry Michel; second premium, $5, to J. M. Jordan.

Splendid vase or basket, first premium, $10, to Mrs. Mena Michel, St. Louis county.

Large round table bouquet, two feet high, first premium, $10, to Henry Michel; second premium and Lindell hotel prize, to William Schrey, St. Louis.

Pair round hand bouquets, first premium, $5, to Julius Kœnig; second premium, $3, to Charles Beyer, St. Louis county.

Cut flowers, largest and handsomest collection, first premium, $10, to Henry Michel, St. Louis county.

Roses, 24 varieties, first premium, $10, to Louis Rindfliesch; second premium, $5, to C. Young, St. Louis county.

Roses, 12 varieties, first premium, $10, to Louis Rindfliesch; second premium, $5, to Henry Michel.

Dahlias, best display, first premium, $10, to Henry Michel; second premium, $5, to C. Young, St. Louis county.

Dahlias, 24 varieties, first premium, $10, to C. Young; second premium, $5, to Henry Michel, St. Louis county.

Dahlias, 12 varieties, first premium, $5, to C. Young; second premium, medal, to Henry Michel, St. Louis county.

Largest and best collection of hardy perennial flowers, second premium, $5, to Henry Michel, St. Louis county.

Twelve varieties large showy leaf plants, second premium, $5, to Julius Kœnig, St. Louis.

Twelve varieties showy variegated leaves, first premium, $10, to Julius Kœnig; second premium, $5, to Julius Kœnig, St. Louis county.

Twelve varieties in bloom, annual excepted, second premium, $5, Charles Beyer, St. Louis county.

Three varieties in bloom, annual excepted, second premium, $5, Henry Michel, St. Louis county.

Three varieties for ornamenting vases, second premium, $5, Julius Kœnig, St. Louis county.

Six varieties running plants in bloom, on pillar or trellis, first premium, $10, Henry Michel, St. Louis county.

Six varieties running plants not in bloom, on pillar or trellis, second premium, medal, to Henry Michel, St. Louis county.

Pansies, twelve varieties, first premium, $5, to Henry Michel, St. Louis county.

Phloxes, six varieties, first premium, $5, to Henry Michel, St. Louis county.

Greenhouse plants, largest and best collection, first premium, $50, to Henry Michel, St. Louis county.

Most tastefully arranged group of rare greenhouse and other plants, first premium, $20, to Julius Kœnig, St. Louis county.

PRIVATE PREMIUMS BY BEN. SANFORD.

Best and largest display of rare tropical flowers, first premium, $50, to Julius Kœnig, St. Louis county.

Best and largest collection of greenhouse plants, first premium, $50, to Chas. Beyer, St. Louis.

Dried grasses, discretionary premium, $5, to Mrs. D. J. Dougherty.

PRIVATE PREMIUM BY THE LINDELL HOTEL.

Best round table bouquet, two feet high, $15. The premium was awarded the very handsome bouquet of Wm. Schrey, of St. Louis county.

In the fruit hall were long rows of tables, covered and almost seeming to yield under the immense load of peaches, apples, pears, plums, quinces, grapes, etc., each among the most choice of its species. The display was not as large as usual, but it was creditable, and the arrangement of the whole was made with much taste. Here and there flowers were intermingled with the fruit, and helped to set off the tables and clothe them with additional interest.

For the best collection of fruits of all kinds by one exhibitor, no award was made. This is the more strange from the fact that all varieties of fruit grow in Missouri, even larger and more perfect than in the eastern and middle states. Perhaps it resulted from the idea that this premium would be warmly contested, and that it would require a considerable display to win it. As it resulted, there was no contention sufficient to make the award—so judged the committee.

Apples (summer, fall and winter varieties).—To Mrs. C. A. Gilmore, of Carlyle, Clinton county, Illinois, was awarded the first premium, who, angry with the character of the award, tore up the check that was given her by the secretary of the association, though the same was in accordance with published information concerning the awards. She repented afterward, we are told, and wished the secretary to reissue to her the check she had before destroyed; this he refused to do. Messrs. Boyles & Bro., of St. Louis county, received the premium.

Autumn Pears.—The first premium was given Messrs. J. A. Mason & Son, of St. Louis county, Mo., and the second to Dr. H. Clagett, of the same county and state.

Winter Pears.—Again the first premium is awarded to Messrs. J. A. Mason & Son, the gentlemen above named, and the second premium to James McCausling, of St. Louis county, Mo.

For seedling pears, no award was made; but for the best collection of pears by one exhibitor, Messrs. J. A. Mason & Son again took the first premium.

For peaches of good varieties, twelve of each, Mr. D. W. Morse, of Tunnel station, Jefferson county, Mo., received the first premium, and Mrs. Lucine Langford, of St. Louis, the second premium.

For seedling peaches, twelve of each, Mr. Vendelin Suer, of St.

Louis, received the first premium, and A. Priesmeyer, of the same place, the second.

For three varieties of plums, no award was made.

For plums, twelve in number, Mr. J. H. Sales, of St. Louis county, received the first premium, and Mr. James McCausling, of the same county, the second.

For nectarines and apricots, no awards were made.

Quinces (12 in number).—There were many entries. The excellent collection of Mr. R. A. Carter, of St. Louis county, Mo., bore off the first premium, and the collection of Mrs. E. G. Pratt, of the same county and state, the second.

Grapes (sample from a vineyard not less than one-half acre).—The display of grapes was magnificent, the clusters were thick and luxuriant, the fruit rich and luscious. We doubt if on the globe there be a soil where finer grapes are raised than upon the soil of Missouri, and the variety and quality of them is yearly improving. Missouri wines are now widely known, and are destined, in the future, to become more widely known. Mr. J. R. Mason & Son received the first premium, and Mr. J. M. Jordan the second.

The premium of $5 for the six best bunches of grapes was taken by Mr. H. B. Christian, of Victoria, Mo.; the second by Messrs. E. R. Mason & Son.

Messrs. Mason & Son again took the first premium of $20 for the best collection of grapes, six bunches of each variety.

Mr. D. T. Jewett, of St. Louis, received the premium of $5 for the best collection of foreign field grapes.

PRIVATE PREMIUM BY SOUTHERN HOTEL.

Best ten pounds of grapes, $15, awarded to D. T. Jewett, of St. Louis county, Mo.

Class F.

FINE ART DEPARTMENT.

BEN. SANFORD, *Superintendent.*

The visitor has passed through the agricultural, mechanical, floral, horticultural, and other departments of the great fair. "All is admirable and choice, complete even in the minutest detail; every interest is represented." He exclaims: "Is there anything more, I wonder?"

Yes, there is the art hall yet. It sleeps under the lofty trees, in a remote part of the grounds, couched, as it were, in a green basket—its location is both appropriate and picturesque.

To one who has in his mind's eye the creations of the old masters, Titian, Raphael, Paul Veronese, Leonrardo da Vinci Rubens, Corregio, Holbein, etc., which will live eternally, the efforts of our fair, and even of America, seem pusillanimous. But America is young—her free institutions, the high rank she hold in the family of nations, her commerce, her riches, claim the admiration and excite the wonder of the world.

Americans are intelligent and active; their skill, energy and enterprise is equal to any task; but let us own up frankly that our attainments in the fine arts are but small; our advance toward their attainment, however healthy and expansive, and our love for and admiration of them, unfeigned.

As warriors, we have equaled any in the world's history; as sailors, inventors, mechanics, farmers, we have surpassed every other people; we have geologists and historians that rank with the very first of foreign nations; poets and novelists enough to show that we have capacity in that line; and when clothes, food and shelter are more easily obtainable by the auxiliary aid of improved machinery; when the universal race after the "almighty dollar" is somewhat abated; when genius is honored and encouraged by the wealthy—then will American artists arise—painters and sculptors—who will ask admittance to the temple of fame, as joint heirs of inheritance, with the best painters and sculptors of the past age.

Here in the primeval forest, where but a few years ago the Indian and wild buffalo roamed in the grounds of the agricultural and mechanical association, on the west bank of the Mississippi, a young but vigorous tree has taken root. Let us enter the hall and view its first buds. The spectacle is brilliant and beautiful. Paintings of all descriptions deck the walls of a well-lighted and handsomely arranged building; statues gaze upon you at every turn; tables along the sides of the hall present you with many attractive specimens of artistic workmanship; while the brilliant crowd of spectators, mostly ladies, in their gay attires, with laughing eyes and delighted countenances, contribute to render the scene more animated and interesting.

The general effect is striking; the picture-covered wall, diversified by paintings in oils and water colors, pencil and crayon drawings, photographic views and daguerreotypes, miniatures on ivory and photographs on porcelain; statuary in the niches and at pleasing intervals along the pass way; noteworthy and beautiful specimens of fine art workmanship at every turn, are among the features of this hall—a place, of all others the most pleasant and interesting to one of refined and cultivated tastes.

Cast your eye upon the painting of J. C. Thorn—how vividly it represents the grandeur of the vast ocean, her bubbles and ship onward borne to the trackless wastes of the watery main; upon the two fruit pieces, by Miss Peale, of St. Louis—the melon seems to have cracked open at the approach of the knife; how luscious the inside! then, too, how natural are those grapes, peaches and pears; upon the cattle piece of Cooper, an English artist—it gives solid evidences of an artistic touch; upon the picture by Le Vasseur—a girl bathing; how coy she looks, partially hid among the sedges, the glassy stream reflecting back her image; upon the autumn scene, by Fetters—the wild woodland, the variegated hues of the falling leaves are well portrayed; upon the striking and very meritorious representation of Pilot Knob at sunrise, by Julius Kummer. The majestic appearance of this vast iron mountain, and the wild scenery adjacent to it, are faithfully portrayed; upon the landscape scenes, by the same artist, of the Mississippi river—how naturally the water rises, here and there, hurries around in dark circles, and then surges on in its ceaseless career toward the vast ocean; upon the "indignation meeting" of dogs, met to protest against the "dog tax," by J. Lockhart Smith—the dogs look as if determined to have redress if the city council will only listen to reason; the chairman sits on the rostrum, as if thoroughly convinced that this honor is purchased by the "merit of the wearer," the speakers are confident and bold, the meeting is orderly, and the beholder is entirely persuaded that if wise and moderate resolutions will bring repeal, the delegation of wise heads there assembled will be certain to obtain it; upon the ivory portraits and porcelain miniatures, by Emil Herzinger; upon the varied specimens from Fitzgibbon's palace of art—many of the paintings on ivory and porcelain by the skillful hand of a distinguished Sweedish artist recently come to our city, Mr. Salmson by name; upon the large statue in composition and wood of the "Immaculate Conception," by Perrin, a native young artist of much ability and promise; upon the pictures of Hœfel, Van Bregen and Vanderbeck, all bearing evidence of genius; upon the pictures of the old Dutch burgomaster, of Henry Clay, of John the Baptist, from the private gallery of Mr. Ben. Sanford; upon two marine views by Perkins; upon an interesting night scene of gypsies, from the private collection of Mr. Berthold; upon the splendid portrait of a monk, from the private gallery of Mr. Charles Chouteau; upon the paintings of Mr. Leopold Gast, Niagara falls, and the battle

of Wilson's creek; upon De France's portraits; upon the very handsome crayon liknesses; upon many gems of the porcelain style; upon the bas-reliefs of excellent execution; upon the Madonna, by Perrin, and upon the model of the Southern hotel, made of candied sugar by the head cook of that establishment, completed with singular exactness.

The fine art department was a success, and formed one of the most attractive features of the fair.

REPORT OF AWARDING COMMITTEE—"FINE ART HALL"—CLASS F.

Bust in clay, plaster or terra-cotta, Missouri made, original life size. P. J. Perau, St. Louis, Missouri, first premium.

Statue in marble or stone, or cast in bronze. E. W. Warne, St. Louis, Missouri, first premium; P. J. Perau, St. Louis, Missouri, second premium.

Statuette in marble or stone, or cast in bronze, "original." Muldoon, Bullett & Co., St. Louis, first premium.

Alto-relievo in clay, plaster, terra-cotta or wax, "original." P. J. Perau, St. Louis, Missouri, first premium.

Basso-relievo in clay, plaster, terra-cotta or wax, "original." P. J. Perau, St. Louis, Missouri, first premium.

Basso-relievo cut in marble or stone, or cast in bronze, copper, silver or gold, "original." P. J. Perau, St. Louis, Missouri, first premium; Henry J. Filzinger, Belleville, Illinois, second premium.

Carving in Wood.—The first premium to Mr. Barth, of St. Louis, Missouri; the second to L. Hannawald, of the same city.

Animal Painting (oil, original).—To J. Spore, of St. Louis, was decreed the first premium.

Fruit Painting (oil, original).—Both the first and second premiums were awarded the pictures of Miss S. M. Peale, of St. Louis, Missouri.

Flowers (painting in oil, original).—To F. Hoefel, of St. Louis, the first premium was awarded.

The first premium for landscape in oil was obtained by Hope, of New York City; the second to Julius Kummer, of St. Louis, Missouri.

To the marine scene in oil, of James Spore, of St. Louis, the first premium was awarded; also, the second premium, for a scene of the same character.

For a Head (cabinet size, oil).—W. Levin, of St. Louis, was awarded the first premium; to E. Herzinger, of the same city, the second.

For a Head (life size, in oil).—The first premium was awarded to W. J. Hinchy, of St. Louis, Missouri.

Composition in Oil.—M. Greene, St. Louis, Missouri, second premium.

Historical in Oil.—Scholten & Herzinger, St. Louis, second premium.

Fruit in Water Colors.—F. Hoefel, a diploma.

Flowers in Water Colors.—Mrs. M. J. Goodrich, Hannibal, Missouri, second premium.

Engraving (wood cut).—William Mackwitz, St. Louis, Missouri, first premium.

Lithography.—F. B. Dutcher, St. Louis, Missouri, first premium; Gast, Moller & Co., St. Louis, Missouri, second premium.

Lithography in Colors.—Gast, Moller & Co., St. Louis, Missouri, first premium.

Stipple Crayon Drawing.—J. Gast, St. Louis, Missouri, first premium; J. Gast, St. Louis, Missouri, second premium.

Crayon Stump Drawing.—John Gast, St. Louis, Missouri, second premium.

Pastile Drawing.—The first premium was awarded W. J. Hinchy, of St. Louis.

For Crayon (a chalk drawing).—The first award was given to J. Gast, of St. Louis; the second to Miss Susie A. Long, of the same place.

For Colored Crayon Drawing.—Scholten & Herzinger, of St. Louis obtained the first premium.

Pencil Figures.—W. C. Harney, of St. Louis, was awarded the first premium; Herman Gelford, of the same city, the second.

For Pencil Landscapes.—John Gast obtained the first premium; F. Hoefel the second. Both are of St. Louis.

For Landscape with Pen.—Samuel Hazen, of St. Louis, was awarded the first premium.

For Architectural Drawing.—John Gast, of St. Louis, obtained the first award.

The premium for the best collection of artists' materials was awarded J. Spore, of St. Louis.

For Flowers and Fruit Painting on Glass.—F. Hoefel, of St. Louis, was awarded the first premium.

Collection of Gilt Frames.—James Spore, St. Louis, Missouri, first premium.

Miniatures on Ivory.—Scholten & Herzinger, St. Louis, first premium; Scholten & Herzinger, St. Louis, second premium.

Daguerreotypes.—F. H. Easterly, St. Louis, Missouri, second premium.

Plain Photographs.—John A. Scholten, northwest corner of Fifth and Olive streets, St. Louis, Missouri, first premium; J. A. Seibert, St. Louis, Missouri, second premium.

Photographic Views.—J. A. Scholten, St. Louis, Missouri, second premium; also, private premium of J. Kummer.

Steroscopian Views.—J. A. Scholten, St. Louis, Missouri, second premium.

Photographs in Oil.—Scholten & Herzinger, St. Louis, Missouri, first premium.

Photographs in Water Colors.—Scholten & Herzinger, St. Louis, Missouri, first premium.

Photographs on Porcelain.—Scholten & Herzinger, St. Louis, Missouri, first premium; J. H. Fitzgibbon, St. Louis, Missouri, second premium.

PRIVATE PREMIUMS.

Mr. J. Spore, No. 32 North Fifth street, offers $100, to be paid in artist materials, viz: Best crayon, or pencil drawing, by a pupil of any public or private school, first premium, $50; second premium, $30; third premium, $20. The first premium was awarded Miss Jennie Conn, of St. Louis; the second, to Miss Susan F. Smith; the third, to Miss Mary J. Dougherty, of the same city.

Messrs. Tracy & Bristol offer, for the best landscape oil painting, original, by an artist of Missouri, $100. This premium was decreed the painting of Ferdinand Hoefel, of St. Louis.

Mr. J. McNichol, corner of Fifth and Chesnut streets, offers for the best landscape oil painting, original, by an artist of Missouri, $25. Julius Kummer, of St. Louis, obtained the premium.

The steel engraving of M. Whaling, exhibited by D. B. Woods, was awarded the first premium.

Elevation for Dwelling.—That of E. E. Myers, of Springfield, Illinois, obtained the first premium.

The committee said: We take the opportunity of reporting as very favorable, the following articles, viz.

Landscape Oil.—By Miss Mary J. Parker.

Pencil Landscape.—By Miss Sallie E. Williams.

The following deserves especial mention, and the committee respectfully request that they receive a diploma and medal:

First. The American lead pencil company of New York, for the finest display of pencils, artistical and mechanical, pronounced by the committee as second to none in use.

Second. The Goodyear india rubber company, for fine display of rubber articles; also, Messrs. Coloney & Fairchild, ribbon map of Mississippi river—a valuable guide for travelers and pilots.

We regret that we are unable to give a more minute and detailed account of the premium pictures. It would have afforded us pleasure to describe each one minutely, but we have no material at hand that will enable us to do so. Certain it is, that the display in this department was exceedingly creditable. The community evinced their appreciation of it in the most flattering encomiums of praise. All admitted that, in some of the pictures, genius of the highest order was evinced, while no single one of them was devoid of merit.

No. 1.—MUSICAL INSTRUMENTS.

Pianos (grand or semi-grand).—Diploma and $25. The premium was awarded Knabe & Co., Baltimore Maryland, represented by P. G. Anton, of St. Louis.

Square piano, No. 129, from the St. Louis manufacturing company, was awarded first premium. To L. C. Merkel, No. 1427 South Carondelet avenue, was awarded the first and second premiums. The first premium was $20; the second, a diploma.

For the best violin, the premium, a diploma, was awarded to John Bruun.

For melodeons, the first premium, a diploma, was decreed Prince & Co., of Buffalo, New York, represented by Balmer & Weber, of St. Louis.

Philip Phillips & Co., first premium for parlor organ, one of the manufacture of S. D. & H. W. Smith, of Boston, Mass.

For flutes and guitars, Balmer & Weber, of St. Louis, were the fortunate competitors for the premiums, a diploma, respectively.

To the billiard table of J. M. Brunswick & Co., of Cincinnati, Ohio, the premium, a diploma, was awarded.

To visit the large hall set apart for musical instruments was agreeable in the extreme. There were collected together the best instruments, which alternately discoursed the sweetest music, commanded by the skill of the most practiced artists of the community. A crowd of gay and happy visitors were constantly thronging the apartment, and their looks and actions testified how much they were pleased with the exhibition.

To those who delighted in the "concord of sweet sounds," the musical hall was very attractive.

Class G.

TEXTILE FABRICS.

BENJ. O'FALLON, *Superintendent.*

We have seen, in the previous record of these pages, that lovely woman, made to temper man, and painted fair like the angels, has on several occasions contributed her industry to highten the attractions of the fair, but in none of the departments were the refining and civilizing beams of her influence better reflected than in the textile fabric hall.

As we witnessed the multitude of pretty and curious articles here displayed, mostly the offspings of her genius and handicraft; as we admired the beautiful decorations of the hall, which gave gratifying and cheering evidences of her taste; as we viewed around us the blooming girls, decked in all that luxuriance of beauty with which the painters ordinarily draw Hebe, open, sprightly, modest, alluring; as we saw the evident desire to please which lit up their faces and hightened their other charms, we could not find it in our hearts to blame the man for wooing, winning and loving them, though their name is said to be "frailty." Let them be false as sandy earth, variable as the winds, yet they are ever true to the kindred points, heaven and home. The world, and even the fair, wanting of the benign influences of their civilizing natures, would be tame indeed. The association thanks them that their kind thoughts and gentle wishes have gone along with them in their undertaking.

On entering the hall the spectator was filled with surprise at the fullness, variety and richness of the display meeting his gaze from all sides—portraits of well known characters, statues, landscape sketches, crayon drawings, tapestry, etc., etc. Then was transported by the rare scene presented from the dazzling show cases, with their rich contents of sea shells, chenille work, artificial flowers, etc.; then was struck into wonder and amazement at the vast heaps of woolen fabrics, cloths, rugs, blankets, mittens, etc., of every variety; then at the extravagance displayed in ladies' dresses, counterpanes, quilts, etc.; then at the ingenuity, skill and patience that it must have required to complete the ottomans, pincussions, worsted embroidery there exhibited in such prodigality and profuseness.

Of this hall, filled with articles so superb and unequaled, it is difficult to give an adequate description. Its arrangement was tasty in the extreme. The awards were as follows:

The worsted tapestry work, all of which was pretty, well executed and meritorious, was much admired. There were thirteen competitors, and only two premiums. The charming, elaborately executed,

and superbly framed picture representing the attempted assassination of the Czar Peter the Great, of Russia, and the interposition of the princess to stay the sword of the assassin, won the admiration of the committee; it would have been strange for it not to have done so. The utmost courage was depicted in the demeanor of the princess, while the natural fury of a demon seemed to animate the assassin—all was as life-like as tapestry cloth could express it. It was the work of Mrs. Fanny Martin, of St. Louis, and to her was awarded the first premium, $10.

To Mrs. Helen L. Kormendy was decreed the second premium, $5, for a piece elegant in design and tasty in finish. It represented the aged patriarch Jacob, now restored to his long lost son, being presented by him to King Pharoah. The filial tenderness of Joseph, the aged infirmness of the father, and the royal greatness of the king, all speak forth from the worsted.

There were fourteen entries for the premium in the same work by girls under fourteen years of age. They all exhibited evidences of marked ability, and were each and every one of them creditable to the misses that designed and executed them.

The first premium, $8, was awarded to Miss M. V. Whitmore, thirteen years of age.

The second premium, a diploma, to Miss Kate Adami, only nine years of age, for a representation of the "Immaculate Conception." The execution was surprising for one of her years.

A second premium, $4, was also awarded Miss Anna M. Burns, thirteen years of age, for a scene in which ten or more figures were tastefully grouped. It was well deserving of the award.

For the best specimen of Netting, $5.—Of all the competitors for this premium, Mrs. Hinckler, of Belleville, Illinois, was accounted the fortunate winner. It was as nicely done as anything of the kind could possibly have been done.

For the best Knit Woolen Stockings.—Mrs. J. H. Sale, of St. Louis, was the favored contestant. All know the virtue in a nice home knit pair of stockings; there is much comfort in them, and these were as soft and nice as one could desire.

For Cotton Knit Stockings.—Of the numerous entries, the excellent ones of Mrs. M. Baker, of St. Louis, were accounted the premium pair, and received the premium accordingly.

Of Woolen Knit Socks.—The superb pair of Mrs. C. Goff, of St. Louis, were pronounced the best on exhibition, and were awarded the premium, $5.

For socks knit by a girl under ten years of age, the first premium, $6, was awarded Miss Laura Hinchman, only nine years old—they were an excellent piece of workmanship, and were deserving of the award. The second premium, $3, was awarded Miss Annie V. Fuller, for an elegantly knit piano rug.

Fancy Socks or Stockings for Children.—There were numerous

entries, forming, in all, as tasteful a collection as one could see anywhere. To Miss Nettie Probst the premium, $3, was awarded.

Knit Counterpanes.—They were all beautiful; it was difficult to decide between their respective merits. The premium was finally awarded the elegant one exhibited by Mrs. Pryor, of Vicksburg, Mississippi.

Bonnets of Shuck or Straw.—These were quite novel in construction, ingenious in design, and pretty in appearance. The premium, $5, was awarded Mrs. L. A. Martindale.

Best display of Ladies' Bonnets.—The exhibition of these much talked of, much observed articles of ladies' wearing apparel, made by the Misses Lewandooska & Friese, in variety, elegance and "tournure," would have done honor to the most fashionable shop of the Boulevards, and were awarded the premium, a diploma.

For domestic wove counterpanes, the one exhibited by Elizabeth Barnett, of Kentucky, was accounted the most beautiful, and was honored with the premium, $5.

Crochet Counterpanes.—These were elegant in the extreme; there was patience, there was taste and skill; they had set their fate upon a cast of the die; it fell in favor of Mrs. Veronika Mette for the first prize, $8; in favor of Miss C. Fedrow, for the second, $4.

White Quilts (solid work on muslin, first premium, $6; second premium, $3).—The one exhibited by Mrs. J. S. Porter, of St. Louis, which was a beautiful piece of work, was decreed the first premium; that of Mrs. A. Nicholson, Callaway county, Missouri, hardly less beautiful in design or finish, the second.

Quilts, Patchwork (calico).—There were fifteen entries. Fifteen hearts were beating high in anticipation and hope; the fifteen quilts were all elegant—all wrought with the greatest taste. There was not much difference between them. The committee would decide. The blue ribbon was attached to the favorite quilt; the anxious face of a beautiful young girl lit up with joy—it was the face of Miss Sallie Bryan, of Gallatin, Missouri. Two others were still to be made happy; they were Mrs. Lizzie Stelle, of St. Louis, and Miss E. A. Buskett, of the same city; the one with the second premium, the other with a diploma.

For a handsome pair of cotton knit socks, the premium was awarded the beautiful and well made pair of Miss H. Israel, of Jacksonville, Illinois.

Quilts (worsted).—There were fifteen entries, all beautiful. Think of the long days and weary hours spent in their completion; success or defeat hangs upon the moment. Whose heart should palpitate with joy or ache with disappointment? Mrs. M. A. Maguire, of Linn county, Missouri, and Miss E. A. Buskett, of St. Louis, were the fortunate ladies. The one received the first, the other the second award.

Silk Quilts.—The competition was animated. The eighteen entries were all elegant in design, in execution and finish; were as

beautiful as practiced fair hands could make them. Whose fair cheeks were to be flushed with triumph? What heart leaped highest with hope? No matter, it is over now. Mrs. B. Bridges, of Sedalia, Missouri, was awarded the first premium, $15; to Miss Kate Robinson, of Paris, Missouri, the second, $7.

Silk Comforts.—They were all as pretty as could be. Mrs. W. G. Goodrich, of Hannibal, Missouri, received the first award, $5; Miss Emma Moon, of St. Louis, the second, $3.

Plain sewing (by girl under ten years of age).—There were six entries. It was pleasant to see the various articles worked by their youthful hands. They had all become, at this early age, admirably proficient with the needle. Their industry was highly commendable, and we wish there had been a premium for every one of them, but this could not be. To Miss E. Smith was awarded the first premium, and to Miss Amelia D. Johnson the second.

Fine Shirts.—More elaborately finished or highly worked shirts were never seen, we imagine, than the eight here exhibited. What labor and toil must have been expended on them! To Miss Betty Eddie, of St. Louis county, was awarded the premium, $5.

For shirts made on machine, which were extremely well made, Messrs. Morrill & Watkins, No. 9 North Fifth, received the premium, $5.

A neat specimen of darning, exhibited by Mrs. R. P. Hannenkamp, of St. Louis, which old-fashioned accomplishment, now unhappily fallen into disuse, we were happy to see revived, and were glad to see honored with a premium.

The specimens of tatting entered, ten in number, all bore the impress of skill, taste and genius. Hopes and fears were again on the "qui vive." Palpitating hearts, of course, there were; some of them little schooled in the rude shocks of disappointment and chagrin that riper years are more familiar with. To Miss Ella Ellwood, of St. Louis, was awarded the first premium; to Miss Clara Geyer, of Kirkwood, the second premium.

The crotchet work entered was as varied as beautiful. Delicious hope again fed many who were doomed to the abyss of disappointment. Fortune smiled in favor of Miss Mary E. Flynn, of St. Louis, for the first premium, and beckoned forward Anna Beutzen, of the same city, to receive the second.

For neat and beautiful specimens of hem-stitching, of which there were four entries, Mrs. M. J. Goodrich received the first premium; Mrs. R. P. Hannenkamp the second.

Miss Anna Beutzen was again honored with a premium—it was for the "best specimen of bead-work," and among seven entries was the best.

Ornamental needle work, with thread floss, first premium, $10; second premium, $5. Of the twelve entries, all were richly embroidered, and made an elegant display. The work of Mrs. G. W. Scollay

was of all accounted the prettiest, and was accordingly adjudged the first premium; to Mrs. George K. Budd, the second.

For chemise yokes and sleeves, embroidered with thread floss, first premium $8, second premium $4, very elaborately and tastefully executed, Mrs. A. S. McBride obtained the first premium; Miss Lottie Weller, the second. For a beautiful embroidered handkerchief, Mrs. Bart. Able received the first premium, $6.

For embroidered infant dresses, Mrs. G. W. Scollay was awarded with the first premium; Mrs. M. J. McLean with the second. To say those articles were got up with great taste and finished in the most artistic and beautiful manner would be superfluous; that they were premium articles, in such a place and upon such an occasion, is sufficient encomium.

Infant skirts, embroidered, were exquisitely finished, and received the admiration of all. The first premium was awarded Mrs. John G. Outley, of St. Louis; the second to Miss Minnie Anderson.

Infant Caps.—All were very recommendable and worthy of praise, and were, of course, all pretty, To Mrs. George K. Budd was awarded the premium.

A pin cushion, which was the admiration of all beholders, for finished work and the tasty manner in which it was gotten up, was the work of Mrs. G. W. Scollay, and received the premium

The Afghans entered were elegant, and sustained well their part toward helping to set off the other beautiful adornments of the room. Of the beautiful, the one of Mrs. Barton Able was pronounced the most beautiful; that of Mrs. Mary Coons, the second prettiest.

The display of silk embroidery was rich and attractive, and consisted of a great variety of articles. The first premium, $15, was awarded Mrs. J. B. Ticknor; the second, to Mrs. M. J. Goodrich, of Hannibal.

The first named lady likewise received the premium for silk embroidered infant shawl, which was beautifully executed, and was universally admired.

Toilet Cushion.—For a very tasty one, Mrs. M. J. Goodrich, of Hannibal, received the first award; Mrs. Wagner, of St. Louis, the second.

Embroidered Covers for Chairs.—For a neat, tasty and highly worked chair cover, Miss Hattie Woods, of St. Louis, was made the fortunate recipient of the first premium; while Miss Jennie Sproule, of the same city, was made equally happy by the receipt of the first award for embroidered covers for ottomans. There, too, was Miss Luta May Thomas, of St. Louis, for her award, the first premium for fancy cushions for sofa.

For a very handsome fancy work basket, which spoke audibly the skill and taste of the designer, Mrs. George W. Russell, of Gray's Summit, Franklin county, Missouri, the first premium was awarded.

For a handsome "woolen shawl," Mrs. M. J. S. Shoot, of St. Louis,

was awarded the first premium; and for a fancy infant basket—complete in every particular—Mrs. Francis Imendœfer received the award.

For worsted embroidery, beautifully executed, Mrs. Bart. Able received the first premium; Miss Hattie Woods, the second.

For porte-monnaies, Henry J. Flugel, 518 Olive street, obtained the diploma and first premium. They were of every variety and style.

For ornamental leather work, Mrs. O. L. Burdick received the first premium; C. Suschitzky, the second. The high polish of these articles, and the various designs into which leather was wrought by the foregoing parties, was really curious and interesting to see.

The shell work, marvelously beautiful, exhibited by Mrs. Mary D. Myers, of Springfield, Illinois, was awarded the first premium; the rich and equally attractive work of Mrs. Egbert Dodge the second.

For Artificial Flowers (exquisitely grouped and finished).—Mr. F. Jaquenin took the premium; for a hanging basket of feather flowers, very beautiful, Mrs. S. M. Moody received the first premium; for worsted flowers, particularly interesting, Miss Elvina Witte received the first premium.

Bouquet of Spices.—The display was a pleasing one. Here were wreathes and bouquets made of spices, nuts, coffee grains, candies, etc. The first premium was to Mrs. M. Baley; the second to Mrs. Anna Webster.

DISPLAY OF WIGS—ST. LOUIS MAKE.

There were cases of wigs, curls, waterfalls, plaits, rats and mice. If sceptical before, we had now, in the face of these cases, to confess that the world is still deceived by ornament; that these snaky, golden curls were designed to make their wanton gambols in the wind on supposed fairness, and that they were well calculated to deceive the most wary. J. A. Pozzoni received the first premium, a diploma and $10; Mrs. M. G. Campbell, the second, a diploma, for ladies' wigs.

Of the many specimens of chenille work, which were all beautifully done, Miss Mollie Bragg took one premium; Mrs. John J. Conroy the other, for chenille work with gold.

D. R. Smucker, corner Second and Olive, and G. W. Alexander, under Southern hotel, offer (each $25) for best shirt made by a lady by hand, $50. The premium shirt, as may be supposed, was very finely made. It was made by Sophia Ockl, corner Sixteenth and Madison streets, St. Louis. There were thirty-nine contestants for this premium.

No. 5.—CLOTHING—ST. LOUIS MAKE.

Best coat of fine material	Diploma and $15
Best pantaloons of fine material	Diploma and 10
Best vest of fine material	Diploma and 5
Best suit of clothes for boy under 10 years	Diploma and 10

The first premium, a diploma and $15, was awarded J. C. Zalle. It was a magnificent coat. The second premium, $10 and a diploma, to Ticknor & Co. The pants were of the finest cloth, and superior in style and finish. The third again to J. C. Zalle. The vest was much admired. The fourth again to Ticknor & Co., for the boy's suit, which suit could not be beat either in style, finish or material.

PRIVATE PREMIUMS.

Messrs. Ticknor & Co., 133 North Fourth street, offered, for the best display of gentlemen's fine clothing, $50. Messrs. Ticknor & Co.'s own display was accounted the best, and to them was awarded the premium.

J. C. Zalle, Olive street, between Main and Second, offered, for the best made coat, $25. The magnificent coat of Mr. J. C. Zalle, himself, was the ne plus ultra, and received the above premium.

For a beautiful specimen of wax fruit, a special premium was recommended Mrs. Mary D. Myers.

For hair flowers, arranged with much taste and artistic skill, Miss Mary Callahan, of St. Louis, was awarded the premium.

For a very handsome, fancy tobacco jar, H. M. Howard, of St. Louis, received the first premium.

For a fine specimen of fleece merino wool, C. H. Beal, of West Virginia, was awarded the premium.

No. 2.—Mill Fabrics of Missouri Manufacture.

The respective premiums for woolen cloth, at least ten yards, and cassimere cloth and jeans, and woolen blankets, and flannel, and lindsey, and tweed, and check, and plaid flannel, were each in turn awarded Messrs. S. Thorp & Co. Their display was very large, and speaks most encouraging for the future prospects of the west in woolen manufactories.

Rag Carpet (at least 15 yards).—The first premium was awarded F. H. Roemler, of St. Louis; the second to Mrs. E. Gay, of Macon county.

For Yarn (woolen, 6 cuts).—The premium to Felix Fine, of Carondelet; for yarn cotton, to J. G. Marriott & Co., St. Louis.

For Home-raised Silk.—The premium was awarded Miss Esther Passamore, of St. Louis county.

We are glad to see such good quality of home-made silk. Why should it not be raised as successfully in Missouri as in the southern part of France, or as in China. The mulberry tree grows wild here. With cultivation it would answer every want of the silk grower. Our soft climate is favorable to the silk worm. Even the little Chinese manufacturer can be naturalized here, and can find rich and abundant material in the foliage of the ailanthus tree for the weaving of its glossy fabric.

Carpet Coverlet.—To the very nice one exhibited by Mrs. N. M. Kline, of St. Louis, the premium, $5, was awarded.

PLAIN SEWING.

To the very fine specimens exhibited by Mrs. E. Dodge and Mrs. Amanda Edgar were awarded the first and second premiums, $6 and $3, respectively.

Class H.

NATURAL HISTORY, GEOLOGY, BOTANY, AND NATURAL PRODUCTS OF MISSOURI.

WILLIAM M. MCPHERSON, *Superintendent.*

The position of Missouri excites speculation as to her commercial facilities; the variety and fertility of her soil, for agricultural purposes, is unequaled; but the abundance of her mineral wealth, her inexhaustible mines of iron, coal, lead, copper, marbles, etc., shed a flood of light upon the wondrous science of geology, and indicate the nature and extent of natural resources, full of deep and peculiar interest.

Geology, as a science so recent—rising within a few years to such prominence, what will become of "miracle?" what of old ethical and religious landmarks? It writes with the iron pen of nature in the silurian, in the old red and new red sandstone formations; it teaches the omnipotence, wisdom, foresight, protection and design of the Creator; it excludes the little religious sects and coteries, that deny God the management of his own world; it brings out artillery, not recently forged, in full play, along its front, to discomfit and put to rout the army of metaphysical assailants; it publishes the fact that the battle of the "evidences" must be fought in the physical world.

Here are chapters in the record of creation, engraven in the solid rock; representative periods, regularly arranged in their order of succession; vertebrata, fishes, reptiles, birds, mammals, all within the jurisdiction of nature, lies open to nature herself.

It teaches the period when the ichthyic was the highest example of life; of the period when all the carnivora and all the herbivorous quadrupeds were reptiles; of the period when birds were the sole representatives of the warm-blooded animals; of the age when quadrupedal mammals were the magnates of creation—when vast herds of colossal elephants were the sole inhabitants of every country in the old and new worlds; and of the period when human dynasty commenced. It witnesses the power of God, the slow, mysterious, universal laws, which have an eternity to work in.

The stony science teaches further that, in slow and solemn majesty, period has succeeded period; that the scripture revealed in the rocks has been written by hand of the great author; that the several races of animals which have had dominion in turn during by-gone ages, entered into worlds ripened for their reception; that, in the creation of the several periods, myriads of years must have elapsed; that there have been re-creations, so there may be a re-creation for the "lost"; that the lapsed race may yet stand on more elevated ground, and may *et* ascend to the place from which all light emanates.

The display in geological specimens was not very large, but exceedingly creditable.

Other states have expressed the intention to compete at the next fair. The association extends a cordial invitation to all. In the old French histories, Missouri is ever spoken of as the country full of mines—"un pays plein de mines"—and unquestionably makes a good display in all kinds of minerals.

The specimens below enumerated form some illustration of the geology of the state.

Soils, sands, clays, and bog-iron, from the *alluvium.*
Clay, from the *bottom prairies.*
Silicious marl, from the *bluff.*
Boulders and wood, from the *drift.*
Sands, clays, sandstone, and iron ores, from the *tertiary.*
Sandstone and chert, and alum in the slate from the *cretaceous.*
Coals, slates, marls, limestone, and sandstones, from the *coal measures.*
Ferruginous sandstone and red hematite, from the *ferruginous sandstone.*
Limestone, from the *St. Louis limestone.*
Limestone and argillaceous slate, from the *Archimedes limestone.*
Limestone, from the *encrinital limestone.*
Hydraulic limestone, from the *Chouteau limestone.*
Porous sandstone, from the *vermicular sandstone.*
Lithographic limestone, from the *lithographic limestone.*
Shell limestone and argillite, from the *Hamilton group.*
Oolite, and sandstone, from the *Onondaga limestone.*
White granular limestone, from the *Ouskany sandstone.*
Blue argillaceous limestone, from the *lower Helderberg.*
Variegated marble, from the *Niagara group.*
Blue compact limestone, from the *Cape Girardeau limestone.*
Hydraulic limestone and slate, from the *Hudson river group.*
Marble and limestone, from the *Trenton limestone.*
Limestones, from the *Black river and Birdseye limestone.*
Limestones, from the first *magnesian limestone.*
White granular sandstone, from the *saccharoidal sandstone.*
Cotton-rock and marble, from the second *magnesian limestone.*
Brown sandstone, from the second *sandstone.*
Marbles and limestones, from the third *magnesian limestone.*
Saccharoidal sandstone, from the third *sandstone.*
Marbles and magnesian limestone, fourth *magnesian limestone.*
Slates and porphyry, from the *methamorphic rocks.*
Granite, greenstone and iron from the *igneous rocks.*

Her minerals embrace copper, lead, zinc, cobalt, iron, nickel, excellent varieties of coals, marbles, marls, fire-clays, pipe-clays, sands, pebbles, soils, native paints, limestones, freestones, granites, slates, porphyries, hydraulic and lithographic limestones, etc. What state in

the Union can show a greater abundance and variety of useful materials than Missouri?

No. 1—Natural History, Geology, Botany, and Natural Products of Missouri.

Best suit of useful minerals found in Missouri, including coals, iron ores, limestones, marbles, sandstones, marls, peats, soils, salines, waters, clays, gypsum, etc., diploma and $50. The collections exhibited were very fine. Several gentlemen, noted for their love of scientific pursuits, and especially for geology, furnished many rare and valuable specimens. To Dr. Theodore Weiss was awarded the premium.

The manner in which these specimens were labelled and arranged gave evidence of the care and knowledge with which they were collected, and enabled the scientific eye to grasp the whole subject at a single glance.

The collection consisted of various specimens of iron ores, limestones, marbles, gold and silver ores and copper; also, samples of pure gold and silver, and many other specimens of a geological nature.

For the best suit of specimens illustrating the mineralogy of Missouri, Dr. Shumard received the premium of $100 and diploma. This collection was perhaps the most varied and valuable exhibited, being composed of an endless variety of ore specimens found in the state; also, a large number from various parts of the world, some unique and curious to a remarkable degree, and such as are highly prized by all lovers of geological knowledge. Some of the specimens of Missouri marble are really beautiful, exhibiting a beauty of color and finish unsurpassed by those to be found anywhere. Also, samples of Missouri copper, a collection of fossils of a very interesting nature, and specimens of quartz crystals from Nebraska, with various samples of gypsum.

To the Doctor many thanks are due. By his industry a fine cabinet has been collected, illustrative of the many valuable, interesting and useful minerals in our state, which, in the future, must contribute much to her wealth and development. His collection of specimens was varied and interesting.

Dr. B. F. Shumard also received the premiums for the best specimen of cannel coal, and for the best specimen of marble, a diploma, respectively.

For the best collection of birds, living or stuffed, $10, J. B. Bates, of St. Louis, received the first award, for his very handsome collection. It was varied and elegant.

For linseed oil, the St. Louis lead and oil company received the award, a diploma.

For varnish, Page, Smith, Lewis & Co. were awarded the premium, a diploma.

For white lead, the St. Louis lead and oil company received the premium, a diploma.

For lubricating oil, the St. Louis coal oil company received the premium, a diploma.

The premium, a diploma, was awarded Enno Sander, of St. Louis, for his very handsome and extensive display of medicines and chemicals.

The premium, a diploma, was awarded the composition roofing of Page, Smith, Lewis & Co. It is a new and admirable invention—is water, fire and frost proof.

For writing ink, Messrs. Metz & Hertz, No. 59 South Seventh, St. Louis, received the premium, a diploma.

For collodion, Enno Sander, of St. Louis, was awarded the premium, a diploma.

For disinfectants, Page, Smith, Lewis & Co., of St. Louis, were awarded the premium, a diploma.

For vinegar, F. Tierman & Co., of St. Louis, corner of Cozzen's and Pratt avenue, received the award, a diploma.

For blacking, Metz & Hertz, No. 59 South Seventh street, St. Louis, received the award, a diploma.

The premium for salt, a diploma, was awarded Flint, Crocker & Co., 136 Morgan street, St. Louis.

For washblue, Metz & Hertz, of St. Louis, received the premium.

For axle and machinery grease and oil, the St. Louis coal oil company were awarded the premium.

To the nitrous oxide gas, exibited by Dr. Geo. H. Silvers, corner of Fifth and Pine, the premium, a diploma, was awarded.

For carbon oil, the St. Louis coal oil company obtained the premium.

For brewer's pitch, the award was made to F. Manschner & Co., St. Louis.

For patent boiler compound for cleaning boilers, A. Harlessy, of St. Louis, Mo., received the premium, a diploma.

For the very handsome display of toilet articles and flavoring extracts, exhibited by Enno Sander & Co., of St. Louis, consisting of almost every variety, the premium, a diploma, was awarded.

Class I.

POULTRY, SHEEP, SWINE.

JEFF. K. CLARK, *Superintendent.*

What articles of more important interest to the country, and to the farmer in particular? what territory better adapted in climate for poultry? What state more fruitful in resources than Missouri for the raising and feeding of swine? Of her 35,000,000 acres of arable land, 2,000,000 acres are the alluvial margins of rivers, the richness of which soil is practically inexhaustible. It will afford abundant corn harvests with which to feed hogs, while the high rolling prairie lands and the hilly regions of the southern section of the state are admirably adapted for sheep. What attention has already been paid, and what improvements are being made in the breeds of these articles, may be seen from the following record.

POULTRY.

The comfort and convenience of the feathered tribe has been admirably provided for. They have a house especially arranged for them; each species, domiciling themselves apart from the rest in ninety different compartments, live in perfect security from the unwelcome visits or attacks of some troublesome or more powerful neighbor. In this beautiful and tasteful wire palace—the gallinarium—the Shanghais, the Bramahs, the Dorkings, the Polands, and the self-important little bantams strut around, arrayed in their gayest plumage, with all the consequential airs imaginable; exhibit their gallantry to their females, and their self-satisfaction in themselves. Another part of this spacious palace is inhabited by the Aylesbury, Poland, Rouen, Muscovy, and others of the duck family; another, by the Toulouse, Bremen, Hong Kong, African, and others of the geese family; another by the turkey and guinea fowl family; another by the peafowl tribe, who parade there in all their pride, vanity and vain glory; and still other parts by the timid little rabbit family, etc., etc.

From the very first day of the fair till its very closing the gallinarium was constantly surrounded by visitors, who expressed themselves much delighted with the display there made. It consisted of the finest specimens of the choicest breeds of all kinds of fowls.

Captain L. W. H. Wright, of St. Louis county, received the premiums for the following: for Bramah pootras, for white Dorkings, for silver-laced bantams, for black bantams, for best pair of chickens of all breeds, for the best pair of Hong Kong geese, for the best pair of turkies, for the best display of chickens, and for the best display of geese.

George Hoffman carried off the premium, $5, for the best pair of Polands.

C. W. Packard was awarded the premium for the best cock and hen, bantam.

S. F. Quinette carried off the first prize, $10, for the best display of game chickens.

The remarks of the committee were, that it was a "splendid display."

To G. H. Sale was awarded the private premium, $25, offered by Capt. L. W. H. Wright for the best cock and two hens, of Bramah chickens.

Jefferson Scott, of St. Louis county, obtained the premium for the best pair of Muscovy ducks.

There was no entry of a pair of Egyptian geese on exhibition, but the committee pronounced them "highly worthy of notice."

To James McCausland was decreed the premium for peafowls.

C. D. Blossom, St. Louis, obtained the other premium of $25, offered by Capt. L. W. H. Wright, for the best cock and two hens of white-faced black Spanish chickens.

A premium was also recommended for the eagles on exhibition, of which there was no entry; also, for the display of rabbits and guinea pigs.

Many of Captain Wright's fowls were pronounced by the committee "extra."

The committe were Messrs. J. M. Jordan, James C. Edwards, and William G. Gaylor.

From the foregoing it will be seen that the raising of poultry and the improving of the species is being given its due share of consideration. It is a prime element in rural economy, and we have here seen the best specimens of the most choice varieties. It shows that there are those among us awakened to the importance of the subject. Eggs and poultry, highly prized articles of food, and easily raised, are now become luxuries. Why is this? It is because sufficient attention is not given the poultry, nor sufficient care paid to the selection of breeds. One egg is said to contain as much nutriment as a pound of beef. They are indispensable in household economy. The demand for fresh eggs and poultry is an every day demand. They are a big item of food, as all experience will testify. There is no article of farm produce that will yield a bigger return for the same outlay than a good hen. She will raise two broods of chickens a year, and supply a large number of fresh eggs besides. We stable our horses and other stock in winter, and bestow upon them the greatest care. It would pay in the same and even a greater ratio to take care of our chickens. There is a gentleman living not more than a hundred miles from Paris, France, who has $75,000 in gold income from his chickens alone. This immense income is from an article which is generally raised by every farmer in our land, but which almost every farmer among us considers of minor importance.

SHEEP.

Sheep raising is a matter of vast importance. They afford most profitable returns. The increase alone is 75 per cent., and the fleece, independent of the yearly product of lambs, will well repay all the trouble and expense of keeping them. We know the immense revenues derived by France from her middle departments, "the ancient Berry," for the product of merino wool; we know the immense profits derived by the English farmer from the raising of mutton for the London market. Portions of our state are peculiarly adapted for the raising of sheep. The subject has of late received considerable attention, and a decided impetus has been given to it. The exhibition in sheep was very fine, and we congratulate the farmers of the state upon the improvements noticeable in their breeds.

No. 11—SAXONS.

Best Saxon buck under two years, first premium, $20, to P. S. Spencer, Danville, Illinois.

Best Saxon ewe under two years, first premium, $20, to P. S. Spencer.

No. 12.—SILESIAN MERINOES.

Bucks (two years and over.)—To the buck exhibited by P. S. Spencer, of Danville, Ill., was awarded ths first premium, $20.

Bucks (under two years.)—P. S. Spencer, Vermillion county, Ill., was the successful competitor, his buck taking the first premium, $20.

To the same gentleman were also awarded the premiums for the best Silesian merino ewes, under two years, and for the best Silesian merino ewe, two years and over; premiums $20, respectively.

No. 13.—FRENCH MERINOES.

Bucks (two years and over).—The premium, $20, was adjudged to the entry made by P. S. Spencer.

No. 14.—SPANISH MERINOES.

Bucks, two years and over, first premium, $20; second premium, a medal. The first premium was awarded to G. F. Davis & Co., of Windsor county, Vermont; the second to P. S. Spencer.

For bucks of the same breed under two years, P. S. Spencer obtained the first premium, $20; G. F. Davis & Co., the second, the medal.

Ewes, two years and over, the first premium, $20, to R. H. Ballinger, Nilwood, Macoupin county, Ill.; the second to T. B. Corey, Green county, Ill.

For ewes, Spanish merino, under two years, Mr. Ballinger obtained the first award, $20; Mr. P. S. Spencer the second.

RAM "PRINCE," OWNED BY R. H. BALLINGER, Nilwood, Macoupin Co., Ill. (See p 598.)

He is a pure Infantado of the Hammond stock, and bred by N. A. Saxon, Vergennes, Vermont. Among the three ewes, over two years old, one was sired by the above sheep that took the first premium at the St. Louis agricultural and mechanical fair, 1866. The best ewe under two years old was also sired by "Prince," and was awarded the first premium at the St. Louis fair, 1866. Mr. Ballinger had on exhibition a flock of thoroughbred Spanish, amounting in number to sixty.

The lot of merino sheep was extremely fine. Among the lot was a buck, called Prince, imported at the cost of $1,000; also, a ewe, named Silver Face, for which $1,000 was paid.

LONG WOOLED.

For Ewes, two years and over, Wm. Miller, of Canada West, received the first premium, $20. The second premium was awarded to Samuel Toms, of the same place.

For Ewes, under two years, Wm. Jackson obtained both the first premium, $20, and the second premium, the medal.

The flocks of long wool sheep exhibited by Geo. M. Collier, of Saline county, Mo., of P. S. Spencer, of Danville, Ill., of Wm. Jackson, of Canada West, and of Saml. Toms, of the same place, were all very fine. The flock of J. H. Pickrell, of Macon county, Ill., were superior, and were deemed worthy of "special notice" by the association.

For Long Wool Buck, two years old, Samuel Toms, of Oshawa, Canada West, was awarded the first premium, $20. The second premium, the medal, to Wm. Miller, of Canada West.

For Buck, under two years, the first premium, $20, to Saml. Toms; the second to Wm. Jackson.

No. 10—Southdown.

Buck (two years and over).—To the fine noble looking bucks entered by Samuel Toms, of Oshawa, Canada West, both the first and second premiums were awarded, $20 and the medal, respectively.

Mr. Toms also received the two premiums for bucks of the same breed under two years of age.

For Ewes, two years and over, Mr. Toms also received the first premium; J. H. Pickrell, of Harristown, Macon county, Ill, the second, the medal.

For Ewes, under two years, the first award was to J. H. Pickrell; the second to Samuel Toms.

PRIVATE PREMIUMS BY THE BUTCHERS AND STOCK DEALERS OF ST. LOUIS.

Best 10 fat wethers, first premium $100; second premium $50. The first premium was awarded the fine lot exhibited by Mulhall & Scaling, of St. Louis; the second premium, $50, to E. K. Leyers, Monticello, Mo.

The premium of $10 for the five best fat wethers was also awarded Mulhall & Scaling. Geo. M. Collier, of Marshall, Saline county, Mo., exhibited the best fat wether, two years old and over, and obtained therefor the premium, $5.

For the best fat ewe, two years and over; for the five best fat ewes, two years and over; for the five best ewes under two years, and for the best fat ewe under two years, Wm. Jackson received the premiums, $5, $10, $10, and $5, respectively.

No. 17—Flocks.

For the largest and best flock of sheep, $50. Samuel Toms, of Oshawa, Canada West, exhibited a very large and fine flock, and to him was awarded the above premium. He had brought several hundred sheep with him all the way from Canada to compete at the great fair. He met there "foemen," as the foregoing report will show, "worthy of his steel," and to overcome whom added new laurels to his cap; for the flocks of R. H. Ballinger, P. S. Spencer, and Wm. Jackson were also large and fine, and were deemed "worthy of special notice" from the association.

To see all these flocks turned loose, bleating loud, and running here and there, on the grounds of the association, after sun set, or now huddled up together cropping the luxuriant grass, afforded a scene of picturesque beauty. But this is not the view practical utility takes of the matter. Their fleece gives employment to the loom, which feeds the indigent; it awards the hand of labor with a variety of wealth; it calls into play the arts and sciences; it joins nations in amity; it teaches them the comforts of civil life; it is no small element in a nation's commerce and prosperity; it checks frosty winter's rigorous approach; it is one of the most important products; there is money in it. We hope soon to see Missouri a large sheep raising state. Have we not opening valleys and yellow plains just suited to this woolly venturer? When new channels are opened to the east, may we not "clothe the California coast and all the realms that stretch from Anian's straits to proud Japan." What more important than wool growing?

SWEEPSTAKE.

Best Buck and Ewe, $50—was won by a noble and splendid looking pair owned and exhibited by William Jackson, of Canada. To John Hatch, of St. Louis county, a premium, $10, was given; also, the additional premium of N. J. Colman, $25, for cashmere goats.

The several committees on sheep were Messrs. James T. Matson, Jacob Bowman, W. R. Duncan, R. H. Stevens, Job Newton, D. Clarkson, I. V. Turner, and P. F. Carter.

SWINE.

One of our chief articles of export, yielding a quick and sure return to the farmer. Why do not the farmers make efforts, by the judicious crossing of the best breeds, to improve the general stock? They are doing much in Missouri to improve it. How much will appear by the several reports of the fairs for the past ten years? Great attention is now being paid to the matter. The fine breeds here exhibited are the best that the country affords, and where should better hogs be raised than in Missouri and the states adjacent to her? The farmers see that the best stock pays best; they are improving their breeds; they are

not deterred from paying the highest prices for choice kinds; they see that it is money well invested. What stocks we have in Missouri, and what are annually brought to the great fair, will appear by the following report. It is a matter to which too much attention can hardly be paid.

The exhibition of hogs was choice and was particularly interesting to our farmers. They collected in crowds around the pens, and elicited much information that will be of great practical utility to them. All who visited the fair will endeavor to purchase and raise select breeds—these are the most profitable.

No. 7—Large Breed.

Boars, two years old and over.—The first premium, $20, and the second premium, $10, were awarded Captain L. W. H. Wright, of St. Louis county, for two excellent representatives of the Chester white breed. They were of large size, of good length, and of the very form to suit a pork packer; they were pure white; they were hardy, well adapted for the west, fatten easily; are prolific and are good breeders, and these certainly had attained large size. They were excellent specimens, and would have claimed the admiration of the greatest novice in swine culture.

For the best boar, over one year and under two, Captain L. W. H. Wright also received the first premium, $20. It was a superior boar, of the Chester white, and as fine in every respect as the foregoing.

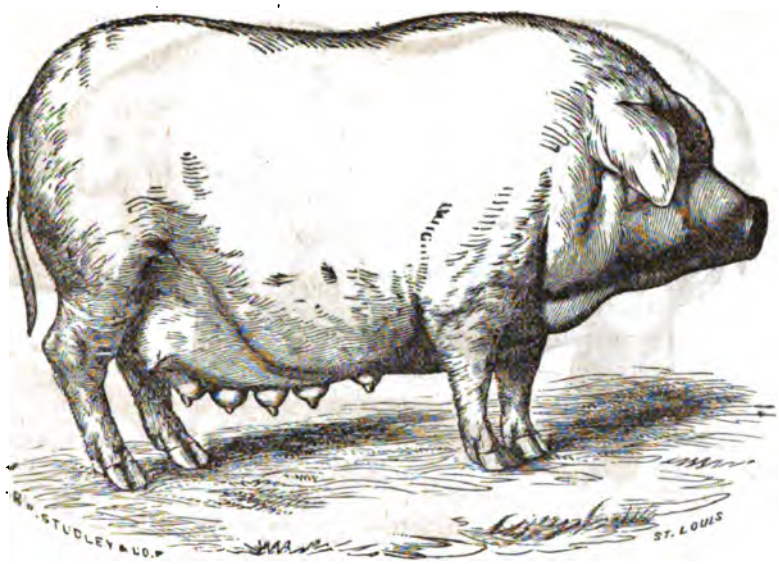
Boars (six months and under one year).—The first premium, $20, was awarded the breed exhibited by the insane hospital of Jacksonville, Illinois, a fine young Chester white, weighing 150 pounds or more.

The first premium, $10, and the second premium, $5, for the best boars under six months of age, were won by the very superior exhibits of the institution for the insane, of Jacksonville, Illinois.

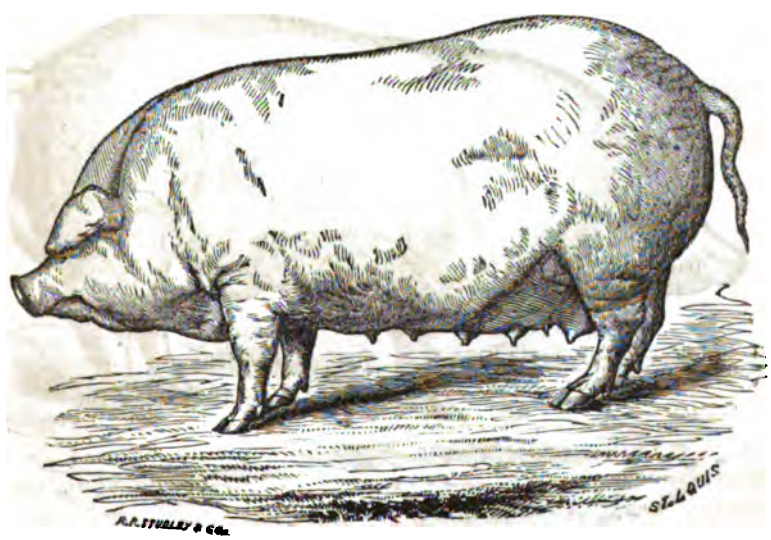
For the best sows, two years and over, the first premium, $20, was awarded the handsome and lengthy sow, of the Chester white breed, owned by L. W. H. Wright; for the second premium, $10, a fine sow of L. W. H. Wright was also the fortunate competitor.

Best Sow (one year and under two).—The insane hospital breed were again the fortunate winners of the first premium, $20; the second was again taken by Captain L. W. H. Wright, of St. Louis county.

Best Sow (six months and under).—The invincible youngsters of the insane hospital could not be beaten. It was not possible anywhere to find a finer set of young animals of the large breed. To them was awarded the first premium, $20. To A. J. Cummings, of St. Louis county, for his superior sow of the Yorkshire breed, the second premium, $10, was awarded.

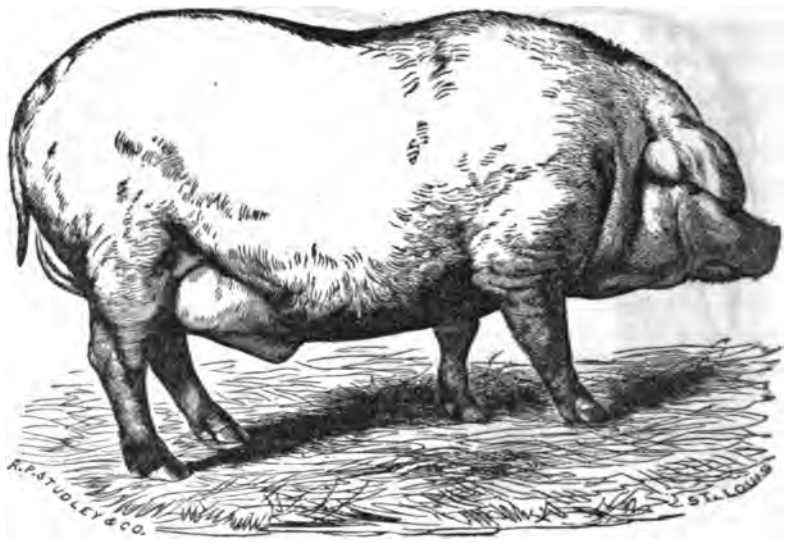


PRINCESS.

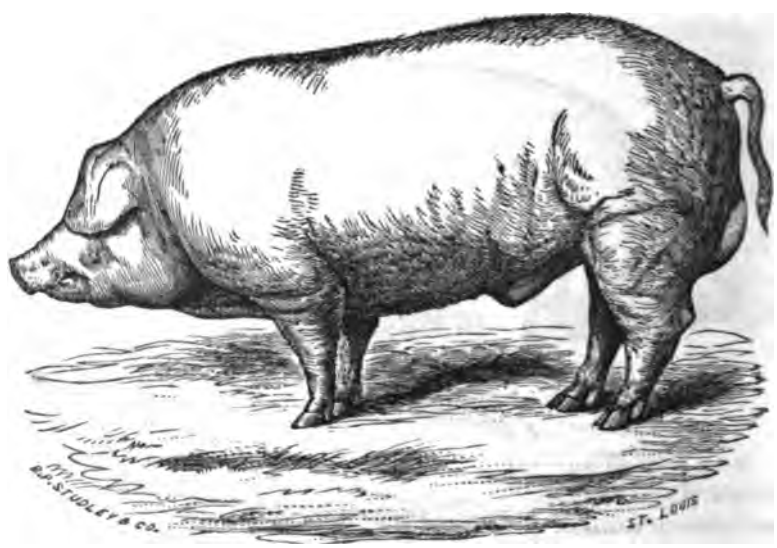


VIRGINIA.

MR. L. W. H. WRIGHT'S PREMIUM CHESTER WHITE HOGS. (See p. 603.)



GRANT.



CHESTER.

MR. L. W. H. WRIGHT'S PREMIUM CHESTER WHITE HOGS. (See p. 603)

For the best sow, under six months, the premium, $10, was again obtained by one of the hospital breed. The young animal was of the Chester white breed. To R. C. McCord the second premium, $5, was awarded for a very superior young sow—cross between the Chester white and Suffolk.

The lot of twenty-five or thirty crosses between the Chester whites white Berkshire and Grazier, were of the very finest specimens. They belonged to the insane hospital at Jacksonville, Illinois. The shoats averaged from 130 to 150 pounds each. They were said to be exceedingly prolific, easy to fatten, of large size and great weight, while their meat is of superior fineness of fiber and delicacy of flavor.

The Chester whites of Mr. Wright were also very fine. They were seventeen in number. Among them was Bob Lee and Virginia, weighing 1200 pounds; Sherman and Princess, 1000 pounds; Stonewall Jackson and Belle, very fine, and weighing 800 pounds; Glenoddie and Andy, 1000 pounds; Grant and Victoria, 1300 pounds.

No. 8.—Small Breed—as Neapolitan, Suffolk, Improved China, Chinese, Mocha, and their Crosses.

For the best boar, six months and under one year, the first premium, $20, was awarded the really fine specimen—an improved China and Suffolk—belonging to Captain A. Phillips, of St. Louis county.

To the same gentleman, an active member of the association, and one who has done much to improve the various stocks of our state, but more especially swine, the first premium, $10, respectively, for the best boar under six months and for the best sow under six months. They were of the China and Suffolk crosses, and were very fine, and richly merited the awards.

Sweepstakes for large breed of swine, the premium of $25 was awarded to L. W. H. Wright. The same party won the premium of $25 for the best sow. They were of the Chester white breed.

For the best boar of any age or breed—small breed—the premium, $25, was awarded Captain Phillips, of St. Louis county; also the premium, $25, for the best sow of any age or breed—small breed—was awarded the same gentleman.

PRIVATE PREMIUM BY FRANCIS WHITTAKER.

Best boar of any age or breed for packing purposes, premium $50; second, $25. The following were the entries: L. W. H. Wright, St. Louis county, Chester white; A. J. Cummings, St. Louis county, Yorkshire; Captain A. Phillips, St. Louis, improved China and Suffolk; Jefferson Scott, Florissant, St. Louis county, Berkshire; same, Tamly breed; insane hospital, Jacksonville, Illinois, Chester white; E. T. & T. J. Irish, Bunker Hill, Illinois, Leicester. First premium to L. W. H. Wright; second premium to Captain Phillips.

For the best sow of any age or breed, for packing purposes, the

entries were the same as the above, and the awards were to the same gentlemen and in the same order.

For the private premium by Edgar Ames, $50, for the best pair of hogs under one year, for packing purposes, the entries were L. W. H. Wright, St. Louis; Captain Phillips, St. Louis; Jeff. Scott, St. Louis; insane hospital, Jacksonville, Illinois; A. J. Cummings, St. Louis; Hunter & McNeil, Greenville, Illinois. The premium was awarded to Hunter & McNeil, of Greenville, Illinois.

For the private premium by John J. Roe & Co., $50, for the best pair of hogs over one year, for packing purposes, the entries were: L. W. H. Wright, St. Louis; Jeff. Scott, St. Louis; Oliver Quinette, St. Louis; E. T. & T. J. Irish, Bunker Hill, Illinois; Hunter & McNeil, Greenville, Illinois. The premium was awarded to Hunter & McNeil.

For the private premiums by the butchers and stock dealers of St. Louis, for the best boar for butcher's use—first premium, $50; second, $25—the same parties entered. The first premium was awarded to L. W. H. Wright; the second to E. T. & T. J. Irish.

Mr. Jeff. K. Clark offered, for the best pair of Chester white hogs, $50. This premium was awarded the superior pair exhibited by Captain L. W. H. Wright, of St. Louis county.

The committee on the above classes were Messrs. James T. Matsen, John Dillon, I. V. Rogers, C. D. Blossom, L. L. Ashbrook, R. F. Lackenson.

We have now taken a cursory glance at the various departments of the fair; we see that the different modes of subduing and cultivating the earth have here engaged the attention of all classes, and that men of opulence and leisure have lent their aid to the same object; we have seen most important improvements in mechanics; we have seen numerous manufactories springing up around us; we have here seen the industry, economy and virtue of our people exhibited; we have here been animated with the most laudable and sanguine expectations of the future growth and prosperity of our state, and at the grandeur of the scene, the vastness of the different departments, and at the immense store of plenty spread around us, a thousand recollections of romance and poetry and legendary story come thronging upon us, bringing reminiscences of the golden age. We have seen our people grasp at the great agricultural interest with eagerness, pursue it with diligence, and we have seen them successful; we have seen the great agricultural and mechanical association, free from all selfish motive, active and vigilant, chastened with purity, in harmony with the industrial pursuits of the country, the guardian of peace, collecting the various products and works of genius from every clime, and fostering every interest that is useful to humanity. We feel that too much encouragement cannot be given it—too much praise bestowed upon its founders.

The present board of directors also claim our gratitude. They have shrunk from no labors, difficulties or fatigues; they have even en-

countered them with pleasure, seeing that their efforts were augmenting the natural resources of a territory more blessed in climate than any on earth; seeing that by their pains meritorious efforts in every art and science were called forth, while agriculture was by no means neglected; seeing that husbandry, of all arts the most improvable, was making rapid strides toward perfection; seeing that the inventions collected by their endeavors were being transported to the bosom of those rich lands where the produce of the earth rewards the laborer a thousand fold; seeing that by their care the secret springs of every true industrial enterprise was being touched; seeing that their sacrifices were consecrated to the great and holy purpose of augmenting the comforts of civilized man.

We know that to "men of noble minds their own deeds are honorable meed."

But gentlemen, in the name of the interests you have subserved, in the name of the citizens of Missouri, in the name of the inhabitants of the valley, in the name of all sexes and ages that have reaped benefits from your labor, we thank you.

AMPHITHEATRE.

The amphitheatre—the immense circular building situate on the most prominent part of the grounds, with seats rising one above another; with private boxes for the directors, the stockholders, the invited guests and the press; with a wide promenade all round, at the sides of which settees are arranged at convenient intervals; and under which and the seats are one hundred booths, fronting the lawn, which supply the necessity of hotels, and at which wine, beer and other refreshments may be had—is appropriated to the showing of fine stock, horses, mules, cattle, etc., and, as may be supposed, is the center of attraction.

Here noble steeds, "thoroughbreds," who trace their genealogy through a long line of distinguished ancestors; here bulls that are distinguished for their own honors and "those of their foregoers; here jacks as fine as knight templar ever rode; here the most celebrated trotters of the land are all to enter; and here, too, graceful riders are to "witch the world with noble horsemanship."

To witness the grand spectacle vast multitudes have gathered in from all parts of this free, prosperous and enlightened republic; here is the student and the professor, the doctor, the lawyer and the divine; here are the merchant, the mechanic and the farmer; here are the representatives of every calling and the representatives of no calling; here is the city belle in all her grace and female loveliness, glistening in silk and glittering in diamonds; here is the sedate matron; here is the country lad, and, by his side, the country lass, in all her voluptuous charms—here have they all come, to give one week to the fair and to the amusements which it presents.

Pomp is not wanting. The judges, with appropriate insignia, are at their places in the "pagoda" in the center of the arena; sweet strains of music float from a band above their heads, and may be heard to the remotest part of the grounds; the guards are stationed at their proper posts to prevent the entrance of any one into the arena who does not belong there; the hearld, in flowing blue sash, mounted on a fine charger beautifully caparisoned, calls the names of the entries in a loud voice, and the ceremonies are begun.

The first entry was draft horses—stallions, four years old and over, first premium, $50; second premium, large bronze medal. The four entries were all inferior; they had not the huge limbs, knotted muscles and size that horses of this family should have; still, the first premium horse, belonging to Samuel Ewing, of Sparta, Randolph

county, Illinois, a dark brown, said to be imported from Ireland, had good action, a broad chest, a short back and was well coupled; the second competitor, John Morgan, owned by W. H. Givens, of Pike county, Illinois, was but little inferior to his more fortunate opponent, Windsor.

The second announcement was for draft horses, two years old and under three. For this there were four entries, only two appearances; and these but little worthy of remark, much less of a premium. However, they were the best the challenge had brought forward, and the first premium of $40 was awarded to Black Hawk Prince, belonging to A. Anderson, of St. Louis county, Missouri. The second premium, a medal, was awarded to Frank, belonging to Nicholas Keaver, of Madison county, Illinois.

The next premium was for draft geldings, three years old and under four. There were five entries; all uninteresting and of no particular merit. The first premium of $40 was awarded to Wm. Eisenberg, of St. Louis county, Missouri. The second, a medal, to M. Meyer, of St. Louis county.

The next premium was for draft mares, breeders, four years and over, which closed with two entries, viz.: Captain A. Phillips, St. Louis county, enters Kate Ames; Dr. T. R. H. Smith, St. Louis county, enters Lottie. They were both fine animals, and to Kate Ames was awarded the first premium, $50, and to Lottie the second a large bronze medal.

For draft mares, three years and under four, the fine mare, Helen McGregory, owned by Captain A. Philips, of St. Louis county, Missouri, received the first premium.

The next was for draft mares, one year old and under, for which Michael Renny, of St. Louis county, entered Fanny and Jenny. No award made.

Here ended this somewhat tedious display. Draft horses, as a general thing, present but little interest to the majority of spectators. The raising of them, however, is of prime importance. It was dinner time; some went to drink and carouse at the various booths; some to seek out a shady nook on the grass plat, in which to enjoy a nice luncheon brought from home; some to eat the sumptuous dinner prepared by the ladies of the southern relief association; and others to join the directors and partake of their collation in the regular lunch room of the association.

The first exhibition in the afternoon was that of draft horses in pairs, in competition for the premium offered by Messrs. Mitchell, Miltenberg & Tansey. There were but two entries for this premium, one hundred dollars, which was won by a pair entered by the Chicago transfer company. They were a pair of stalwart horses, large boned, deep chested, short legged, and knit up like Thessalian bulls.

Four-horse Team.—The gentlemen just named offered a premium of $200 for the best four-horse draft team. There were three entries.

The successful one was an elegant, well matched, showy team of dapple grays, entered by the merchant's union express company, handled by Mr. Gould. The compact, muscular build of the horses, and their fine action and well matched character, made them the favorites in the ring. There was another team, meritorious, that stood a very good chance to win the prize. But the horses in it were not well matched in color. We imagined, however, that they would show the grays that they could jerk a six-ton load out of a mud hole with more ease than their handsome competitors.

Matched Horses for Carriage.—For the premium for matched carriage horses there were five entries. They were all fine. They moved around the ring, now all together, now two by two, now separately, till the respective merits of all were tested. Handkerchiefs were waved by the ladies, and the boys shouted as their favorite team won the advantage. Amid the plaudits of the crowd, around and around go a pair of well matched, fine going, square trotting grays; then comes another very fine pair of grays, who have many friends; then, a pair of bays, of fine size and substance, and showing evident signs of "blood;" then a pair of heavy, high-headed, high-stepping, and stately going, dark dapple grays—these are pronounced the premium horses. The cry from all sides is "take it off!" "take it off!"—but it is the judges who determine, not the ignoramuses outside. The award met with disapprobation by the crowd, many of whom, no doubt, were as well qualified to judge of the merits of a "carriage team" as the committee themselves. They did the best they could, however, and it is not certain their decision was wrong. The first premium was awarded the grays of Wm. Downing, of St. Louis; the second, the bays of S. A. Hatch, of the same city.

Matched Horses for Buggies.—There were four entries made, and a most spirited and interesting contest took place. They were all fine movers; were all "crack teams;" each horse had been selected with the greatest care, and it was difficult to decide which was the best team. As in the last ring, each pair has its admirers. At one time these elegantly trained animals stand champing the bit, as if conscious of the admiration they are exciting; at another time they dash around the ring at a rapid rate, wheeling to the right or left as the slightest pressure of the rein indicates a stop at the score, and straightway are passive again. The decision is finally rendered in favor of the elegant grays, of H. H. Knight, of Chicago, for the first premium, $50; and in favor of Rob Roy and Black Harry, belonging to John C. Payne, of St. Louis county, for the second premium, a large bronze medal.

Matched Mares for Buggy.—The principal event of the day was the ring of matched mares for buggy. There were seven entries, and a very lively ring it was. The trotting was spirited and excellent; the spectators were full of enthusiasm, and cheer after cheer rang through the amphitheatre for the exploits of the respective terms. The most

scientific driving was called into play; long and spirited contests took place around the ring, where there was but little difference in speed. Grace and Kate, Lilly of the Valley and Lady of the Lake, Sue and Clara, Luna and Maggie, Rosa and Sue, Flora and Nellie, Dixie and Tackey, looked their handsomest, and did their best. Dixie and Tackey, owned by R. S. Carr, though not perfectly matched, move in unison, and trot very fair, square and honest, and elicit the first admiration both of the spectators and of the judges; to them is given the blue ribbon. Sue and Clara, owned by Thomas Lapsley, paragons of beauty, grace and action, are complimented with the second premium.

Thus ended the first day. All have been amused, some highly delighted—all satisfied. Not an unpleasant circumstance has occurred; all go home intending to be early at the fair the next morning.

The additional number of clerks that have been employed; the great number of entries that are still being made; the thousands of beautiful ladies from this and adjoining states, accompanied by their fathers, relatives and sweethearts, that honor the occasion with their presence, and grace it with their smiles, all give presages of the triumphant success of the fair just being inaugurated.

SECOND DAY—TUESDAY.

DEVON, AYRESHIRE, HEREFORD, AND ALDERNEY CATTLE.

A. PHILLIPS, *Superintendent.*

The second day opened auspiciously. Toward noon the amphitheatre was full. The show being uninteresting there in the morning, it is presumed, many of the 25,000 persons estimated to be present were strolling about the grounds, or looking through the various departments.

The morning's exhibition was of cattle, and is as follows:

Devons.—For the Devons there were seven entries, four cows, one calf and two bulls.

The first premium, $50, was awarded to Thomas G. Settle, of Bridgeton, St. Louis county; the second, a large bronze medal, to Dr. W. W. Henderson, of Bridgeton, St. Louis county. The bulls, both of them, were very fine; the cows equally so. We have been unable to find the pedigree of either of the above named bulls.

Ayreshire.—There was a very good display of Ayreshires. The

first premium of $50 was awarded to W. Groshon, of St. Louis, for one bull, two heifers and calves; second premium to J. M. Hill, Harristown, Macon county, Illinois. The premium bull's name was Patie. He had a long list of ancestors, and was followed by quite an interesting little family, all bearing strong impress of their paternity. Of the second, we learned neither the pedigree nor name.

GRADE OR NATIVE COWS OR HEIFERS.

Three years old and over.—To Belle, belonging to J. R. Turpin, of Green county, Illinois, was awarded the first premium, $20; the second premium, a medal, to a cow belonging to J. P. Mathews, of St. Louis county, Missouri. Both the above were fine specimens.

Milch Cows.—The first premium, $50, was awarded Belle, above named, belonging to J. R. Turpin, Green county, Illinois. Her full bag, distended udders, and general appearance denoted her to be a very superior milch cow.

FAT CATTLE.

Bullocks, three in number, owned by exhibitor, three years and over.—It would be impossible to see a better lot of fat cattle than were here exhibited. The lot owned by J. M. Hill, of Harristown, Macon county, Illinois, made a superb display. They were as fat as fat could be, and to them was awarded the premium, $50.

Best Fat Bullock, of any age. — The first premium, $40, was awarded the bullock Snowstorm, weighing 5197 pounds, belonging to J. H. Spears, of Menard county, Illinois; the second, to a bullock belonging to J. M. Hill, of Harristown, Macon county, Illinois. They were, both of them, genuine fat bullocks.

Cows, four years and over.—The first premium, $40, was awarded J. M. Hill, of Harristown, Menard county, Illinois; the second, a medal, to Wm. H. Beverly, of Atlanta, Illinois.

Private Premiums Offered by the Butchers and Stock Dealers of St. Louis.—For best fatted bullock, the first premium, $150, was awarded to J. H. Spears, of Menard county, Illinois; the second premium, $100, was awarded to J. M. Hill, of Harristown, Macon county, Illinois, and the third premium, $50, was awarded to J. M. Hill, of Harristown, Macon county, Illinois.

This was all fine stock. We were surprised that most of the premiums were taken by Illinois; for Missouri, as a stock growing region, is superior. The climate is favorable to it, and all kinds of grasses grow luxuriantly. We hope to see her do better in the future.

STALLIONS, GELDINGS, AND MARES FOR SINGLE HARNESS.

Stallions, of any age.—This was a favorite ring with the spectators; it was indeed interesting. Cheer after cheer was given as the respective champions, finely harnessed, entered the arena. There was

Abdallah Jr., Iron Duke Jr., Billy Sherman, Green Mountain, Honest John, Captain Walker, and two Gladiators; in speed, in style and graceful movement they were nearly equal. At first they move slowly, but this cannot last. Some ambitious groom attempts to give his horse the lead; cheers of applause and encouragement greet him from the crowd. Jockey tactics and skill are called into play; off go all the horses; the sawdust flies; the spokes of the wheels become invisible and round and round speed the gallant steeds, while the enthusiasm of the crowd rises to the highest pitch. At length a decision is arrived at by the judges: it is that Gladiator, owned by Archy Taylor, of St. Louis county, has won the first premium, $50, and Honest John, owned by A. T. Irish, of Bunker Hill, Illinois, the second premium, a large bronze medal.

Geldings, four years and over. — This was a splendid ring, and created almost as much enthusiasm as the preceding one. The horses were finely groomed and trained, and in the best condition. The speed and bottom of many of them were well known to the spectators, and the greatest interest was manifested to see which one of these magnificent horses, all of whom were noted for speed, style, endurance and action, would be pronounced the winner. There were eighteen competitors for the honor. They were all moved around the arena at the same time, presenting a superb display; then the merits of two or three together were tested; then those were dismissed for whom there was no "showing," till, finally, the ring was left clear to three or four Frequent trials took place, in which the vehicles were whirled around the arena with incredible speed, before a decision, even then, could be arrived at. To paint the enthusiasm and the wild demonstrations of excitement exhibited by the crowds, is impossible. Finally, however, the awards are made, and the exciting contest ended. The first premium, $50, to Independence, owned by D. W. Bell, of St. Louis; the second premium, a large bronze medal, to Pete Ham, owned by Eugene Laveille, of St. Louis.

Geldings, three years old and under four years.—To the handsome, fine and stylish young horse, of muscle, size and action, Dardenne by name, sired by the celebrated Mat Davis, a Glencoe, out of the superb dark brown mare Mary Forest, who has frequently been pronounced premium mare, owned and raised upon the large stock farm of Dr. George R. Buckner, of St. Charles county, Mo., the first premium, $30, was awarded. The second premium, a medal, was awarded the superior young horse Surprise, exhibited by B. F. Hall, of St. Louis.

The next entry was for mares of four years and over, single harness. The following entries were made, which embraced all the style, finish, get-up and grace of action that could be found in St. Louis and the surrounding country: There was the inimitable Puss, large, fine looking and commanding; there were Tackey and Dixie, St. Louis favorites; there were Sue and Maggie Mitchell, that moved as if by magic; there were Lucy Churchill and Kate Kearney, paragons of beauty; there

were Lottie, Dolly, Kate, Lucy, Belle, White and Goshon Maids, Fannie, and Lady Gray and Lady Alice, little inferior in any respect to the foregoing, and each one of them not without her particular admirers. Of course the enthusiasm among the spectators was nothing abated by the splendid display here made; it augmented; cheers rang through the immense amphitheatre; ladies waved their handkerchiefs; all were in a state of uncontrollable emotion. The contest was between Tackey and Puss. The former was perfectly at home, had been in that same arena, and had there received the plaudits of the admiring thousands. The latter was a young "debutante," whose virtues and prowess were as yet untested. Tackey's glory waned before the more brilliant performances of her young and aspiring rival. The result is told by the following: The first premium awarded to Puss, owned by N. J. Colman, of St. Louis, and the second to Tackey, owned by R. S. Carr, of St. Louis.

Mares, three years and under.—The entries were not near so numerous as in the preceding ring. Those shown, however, were superior animals, and the display made very creditable. To the very promising mare, Mattie Golddust, owned by L. L. Dorsey, of Kentucky, was awarded the first premium, $30; to Helen McGregory, owned by Capt. A. Phillips, of St. Louis county, the second.

Thus ended the exhibition in the amphitheatre for the second day. The enthusiasm there had been unbounded. All had gone off with the greatest possible "eclat." The varied and elegant departments, falling short in no particular to any previous fair, were in their finest array. The mingled joy and surprise of the visitors seemed to foretell that they were but the "advance guard" of still greater multitudes that would succeed them. Many went home; many also remained to see the race on the outside track, as it is called. It is inside the inclosure, and on the grounds of the association. It is about 700 feet short of a mile.

The race would be for St. Louis prize No. 2, for the fastest four year old mare or gelding, in harness. There were three entries, Fannie Kemble, Fannie, and Ella Lyttle. Fannie Kemble, a black, as pretty as she proved herself true, belonging to C. D. Blossom, won the pole and the heat very handsomely. Time 2:24½, taking the prize, $300, with little difficulty.

THIRD DAY—WEDNESDAY.

CATTLE—THOROUGHBREDS.

A. PHILLIPS, *Superintendent.*

Bulls, four years old and over.—First premium, $100; second premium, $40. The first premium, $100, was won by the large, superb and noble looking bull owned by J. R. Brown & Sons, Gallant Duke by name. The second premium, $40, to Duke II, of immense size, muscle and strength, owned by J. H. Spears, of Menard county, Ill. The former is a roan, calved March, 1862, by Ascot (2506), out of Roan Duchess IV, by Grampian. The latter (3868), got by Duke Airdrie, (12,730), out of Bellachini by Fantichini (12,862).

Bulls, three years and under four.—The entries were all fine. To W. R. Duncan, of McLean county, Ill., for a fine looking bull, much admired, the first premium, $80, was awarded. The second premium was given to J. M. Rowan, of Scotland county, Mo., for a bull who was almost as great a favorite with the spectators. We have not the pedigrees of the above named bulls, but doubt not they are of the best.

Thoroughbred Bull, two years and under three.—The premium, $60, was awarded J. H. Pickrell, of Harristown, Macon county, Ill.; name of animal Sweepstake.

Bulls, one year and under two.—This exhibition was fine; young, yet they were of large size. The crowd enjoyed the spectacle, which was indeed pleasing. As they were led around the ring they were frequently greeted with applause. The first premium, $50, was awarded Duke, owned by H. Larimore, of Fulton, Mo. The second, $15, to Hercules, owned by Wm. J. Turpin, of Green county, Ill.

Bulls, under one year.—The yearling ring was excellent, and nothing inferior to the previous ring. The blue ribbon, emblem of the first premium, and $40, was attached to the handsome calf Andy Johnson, owned by J. M. Hill, Harristown, Macon county, Ill. The second premium, $10, was awarded Wm. H. Beverly, of Atlanta, Ill. We did not hear the name of the latter calf; neither have we the pedigree of either of them.

Cows, four years and over.—These were all extremely fine in appearance. It was impossible anywhere to see a more beautiful array of cows. With their glossy coats, finely turned countenances and mild looks, they were really attractive, and elicited more than one cheer from the immense crowd. Finally, they were halted before the pagoda, or judge's stand, and the next moment the blue ribbon, emblem of the first prize, $100, fluttered from the horns of Grace Young, the property of J. N. Brown & Sons, of Sangamon county, Ill. She is of red color, calved March 17, 1857, by imported Fortunatus (1564), out

of Carrie Young, by Wellington (2366). The second premium, $25, was awarded J. H. Spears, for his exceedingly fine looking cow, Strawberry Beauty.

For Thoroughbred Cow, three years and under four.—The premiums, $30 and $20, were awarded the same gentlemen and in the same order. The cattle exhibited by them were all fine.

Heifers, two years and under three.—This ring was quite as attractive as any of the preceding rings. The heifers were generally large and beautiful. To J. N. Brown & Sons was awarded the first premium, $60; to J. H. Pickrell, of Harristown, Macon county, Ill., the second premium, $20.

Heifers, one year and under two.—The first premium, $40, was decreed the handsome, well formed and trim built heifer, Ida Lee, owned by H. Larimore, of Fulton, Callaway county, Mo.; the second, $15, to the almost equally fine heifer, Highland Lady, owned by J. M. Hill, of Harristown, Macon county, Ill.

Heifers, under one year.—A fine, sprightly, and somewhat saucy and overbold looking heifer, belonging to J. H. Spears, of Macon county, Illinois, was adorned with the blue ribbon, and awarded the $30; to the equally handsome and mischievious looking heifer, owned by J. M. Hill, of the same county and state, was awarded the second premium, $10.

Thus ends the cattle show, till the grand sweepstake day on Saturday. The crowd had now swelled to an immense magnitude. Every seat and standing place around the arena was full, when the horse exhibition thus proceeded:

HORSES OF ALL WORK.

Dr. John O'F. Farrar, *Superintendent.*

Stallions, four years old and over.—All eyes are now directed to the gates; they swing open, and one by one the gallant steeds dash in, bright in rig and harness. Still they come, hailing from almost every state in the Union, till the arena is crowded. These noble animals, with nostrils distended, straining every nerve, seem to be as keenly alive to the contest as the spectators themselves, whose cheers reverberate again and again through the immense structure, lending rude beauty and new animation to the novel and exciting scene. Finally, after considerable delay and due consideration, the handsome and stylish Shakespeare Jr., full of mettle and bottom, is halted before the judge's stand—the blue ribbon flutters in the wind—the premium, $75, is his—he has won it. This noble horse is the property of Messrs. Bonta & Lawrence, of Pleasantville, Kentucky. The second premium, a large bronze medal, was awarded the excellent horse Windsor, belonging to Samuel Ewing, of Sparta, Randolph county, Illinois.

Stallions, three years and under four.—Was also a handsome dis-

play. The colts, without exception, give good promise; they were a superior collection of young animals. To Mohigan Chief, owned by J. J. Nichols, of Knox county, Missouri, the first premium, $50, was awarded; to Charley, owned by J. T. Rice, of Alton, Illinois, the second premium, a medal and $30.

Stallions, two years and under three.—Made a very fine showing. They were all well limbed, well muscled and gentle. The whole ring bid fair to make good, serviceable horses. To Black Hawk Prince, owned by A. Anderson, of St. Louis, was awarded the first premium, $30; to Bacchus, owned by N. J. Colman, of the same county, the second premium, a medal.

Mares, four years and over.—This contest was as warm, exciting and as soul-inspiring as any previous one. The excellent qualities of some of the mares in this ring were well known to many of the spectators, who on that account were the more interested observers. After mature deliberation, and after every test had been applied the respective contestants, the decision was rendered. It was, that the superior mare Lucy, owned by Daniel Glasgow, of St. Louis, should receive the first premium, $50, and that the same Puss, who had borne herself so gallantly in the former ring, should be the recipient of the second premium, a medal.

Mares, three years and under four.—The well-shaped, powerful, active and handsome Mattie, owned by L. L. Dorsey, of Kentucky, won the first award, $40; and Helen McGregor, owned by Capt. A. Phillips, of St. Louis county, the second, a large bronze medal. Both these fine young animals will be recognized as the same who have taken premiums in a previous ring.

Mares, two years and under three.—To Dolly, a young mare, full of grace of action and beauty, was awarded the first premium, $30; and to the sprightly, gay and hardly less handsome looking Kittie the second premium, a medal. They are both the property of George W. Rust, of McLean county, Illinois.

Mares, one year and under two.—To the wide awake, joyful looking filly Mollie Tyler, owned by William S. Tyler, of St. Louis county, was awarded the first premium, $20; to the equally fine filly Bonny Forest, owned by Dr. George R. Buckner, of St. Charles county, Missouri, was awarded the second premium. In the Doctor's stable we witnessed several of the finest of the Vandal, Membrino, Glencoe and Morgan breeds.

For the private premium of $100, offered by Messrs. Ubsdell, Barr, Duncan & Co., for the best mare of all work, there were numerous entries—sixteen. The premium offered by one of our most successful, enterprising and liberal dry goods firms was worth competing for. In the arena were recognized several beautiful animals who had taken premiums in other rings. It was a superior collection of mares. They were greeted with the most rapturous applause. Fortune seemed now about to crown one, now another, with success. Another mo-

ment, and the blue ribbon floats from the brown neck of Daniel Glasgow's magnificently put up mare Lucy, which distinguished honor she bears off with appropriate grace of action and modesty of deportment. She is fifteen and a half hands high, with immense power, large shoulder, deep chest, fine quarters, stout bones, and compact build. These are some of the points in the make-up of this superior animal.

Thus ends the third day. There has been a full attendance. The directors have exhibited the best management. All has gone off as satisfactorily and as smoothly as could be wished for. The interest in the fair is on the increase. Excitement rises higher and higher every day; it reaches enthusiasm, and is the forerunner of the unparalleled success that is to attend the fourth day, Thursday, which is to open on the morrow.

FOURTH DAY—THURSDAY.

The day opened auspiciously; not a frown was to be seen in the firmament; all the tears of the month of September had been dried up; the autumnal atmosphere was clear as crystal, and balmy briskness floated upon the breeze. It was a gem of a day—the very jewel of the week.

From early morning wave after wave of living humanity commenced pouring in at every avenue. At the gates splendid equipages, huge farm wagons, beer wagons, trotting wagons, frail sulkies, lumbering carriages, men on horseback, men, women, boys and girls on foot, are all pressing forward to gain an entrance to the grounds. The scene is one of the wildest excitement. Around this struggling, shouting, pushing, crushing, swearing, frantic mass of human passions the lawn of the association spreads out in picturesque beauty; the lofty trees, yet dressed in summer, wave their tops in melodious murmurs, and the green leaves make checkered shadows on the ground. All nature whispers sweetness.

JACKS AND JENNETS.

DR. JOHN O'F. FARRAR, *Superintendent.*

The exhibition in the amphitheatre commenced at 10 o'clock, and ten minutes earlier by an hour than any previous day. The directors were determined, if possible, to finish their generous programme during the day. The excellent band of Herwig gave the signal about 10 o'clock, and the thousands poured into the seats. The first display was of jacks.

Jacks (three years and over).—There were six entries—fine fellows; two of them especially so, which would do honor to any ring. The first premium, $50, was awarded to Rigdon Quick, of St. Clair county, Illinois, for his jack Mammoth Warrior, a black, with mouse-colored points, lacking an inch of sixteen hands, with a tremendous pair of ears and other appurtenances, substantial every way, with good bone and muscular limbs. The second premium, a bronze medal, was assigned to W. J. Davis, of Lasalle county, Illinois, for General Grant. The lieutenant general is neither long-eared nor an ass, or a jack; but this animal was both, and a good one, of indescribable color and excellent quality.

Jacks (two years old).—In this class, R. C. Shackleford, of St. Louis, took the first premium, $40; and D. A. Upson, of Summit county, Ohio, took the second, a medal.

Jacks (one year old).—Rigdon Quick took the first premium, $40, in this class, a son of Mammoth Warrior, mentioned above, called Buena Vista. W. J. Davis took the second premium, a medal, for his jack Sherman.

Jennets (four years old).—In this lot there were four entries. R. C. Shackleford, of St. Louis county, took the first and second premiums, $50 and a large medal, for his jennets Vevie and Fannie. The crowd was well pleased with these awards, as they had been with that to Mammoth Warrior, and signified it by applause.

The Pony Race.—Joseph Garneau, Esq., of this city, offered a premium of $100 for the fastest pacing pony in harness. That handsome premium was taken by Little Arthur, entered by John Williams, of St. Louis. The pony well deserved the prize. He is a very handsome, dark brown animal, remarkably fast, with splendid, free action, and as true and honest a goer as ever appeared in a ring or on any track. He was well handled by James Rutherford, under whose guidance the little beauty excited the admiration and won the shouts of the thousands, with a tremendous flutter of handkerchiefs from the fair women present. The pony is in every respect one of the very best of his class. In form he is as perfect as a mature, well-formed stallion, and as fine a set of limbs as a horse ought to have.

ROADSTERS.

Size, form, action, style and endurance to be taken in consideration by the judges.

The amphitheatre was full to repletion. In this vast circular structure there was not another place to sit or stand. The championship of roadster stallions was to be determined. Sixteen proud, impatient, high-headed, bright-eyed, faultlessly groomed stallions, each one of them famous for some individual exploit, enter the arena. At length the magnificent black horse, Bashaw Jr., owned by Messrs. Starr & Piatt, of Tipton, Iowa, for style, speed, action, discipline, and

general roadster qualities, stands pre-eminent among his compeers. To him is awarded the first premium, $150. The second honor, a large bronze medal, is conferred on Robert E. Lee, a beautiful gray, of fine form, action and speed, belonging to G. W. Wymore, of Clay county, Missouri.

Stallions (four years and under five).—The premium, $100, was awarded the fine young stallion, Young Graco, owned by William Christy, of St. Louis, without competition, the other horse or horses entered for the ring failing to make their appearance in time.

Stallions (three years and under four).—The four entries in this ring bore themselves gallantly. They were fine specimens of approved mettle and style. To Mohigan Chief, belonging to J. J. Nichols, of Knox county, Missouri, was awarded the first premium, $75; to Pilot Jr., owned by G. V. Ward, of Georgetown, Kentucky, the second premium, a large bronze medal.

Stallions, two years and under three.—There were five entries in this ring, all very stylish and promising young horses. To the handsome colt Black Hawk Prince, owned by A. Anderson, of St. Louis county, was awarded the first premium, $50; to the fine colt Black Prince, owned by Dr. T. R. H. Smith, of the same county, the second premium.

Stallions, one year and under two.—This ring made a display inferior to none of similar character that had preceded it. There were among the number those that were very handsome. John A. Logan, owned by J. Beatty, of Jerseyville, Illinois, took the first premium, $40, and W. Clark's "bay colt" the second.

Stallions, under one year.—D. E. Beatty & Sons, of Jerseyville, took the first premium for stallions under one year; J. T. Quesenbery, of St. Louis, took the second. Jersey county seems to have some very fine stock, horses and cattle. We are glad to see Illinois bearing off so many prizes as she has won thus far during the fair.

The name of the first prize ($30) colt was Phil Sheridan; that of the second, Waterloo Jr.

ST. LOUIS PRIZE NO. 4.

For the Fastest Trotting Stallion in Harness, $1,000.—This was the last event of the day. It was looked forward to with much interest by the friends of the respective horses that were to contend. The gates open; in come the finest array of horses to be seen in this or any other country. Most of them have names famous in the turf register.

At the first sight of these splendid fellows, cheer after cheer reverberates through the immense amphitheater; the horses bear themselves proudly, and are conscious that a sea of down-turned faces are upon them. Amidst them all a handsome black, between fifteen and sixteen hands high, without a white hair visible, faultless in build,

stands up peerless; then the little bay, pretty as a picture, with all the elasticity of a cat, calls forth the loud encomiums of praise; then the little brown, with two or three white feet, in noble bearing, in beautiful and even movement, in compact build has no equal, and received unbounded applause; then the powerfully built bay, a fine stepper, and honest, with heavy mane and tail that hung in thick waves, and nodded as he stepped, was much admired and had many friends. It is soon evident that the strife for the championship is between the above described. The rest are shut out. The black, Bashaw Jr., is the first to bring the matter to a practical test; with lofty step and vigorous action he makes nine circuits around the arena, each one of which is said to be a little over one-eighth of a mile, in three minutes and thirty-two seconds. Next the little bay, with nervous and quick action, and now and then astonishing bursts of speed which awaken the shouts of enthusiasim, makes the nine circuits in three minutes and thirty-one seconds. The two others are only a few seconds behind and have performed their work beautifully. Amid the huzzas of the multitude the herald announces that Pilot Temple, owned by S. S. Grant, is the winner of the St. Louis prize No. 4, $1,000.

In the amphitheater the day's exhibition closed with a novel spectacle. Two buffaloes, harnessed and attached to a light wagon, were driven into the arena. It afforded much amusement to the immense multitude, many of whom had never seen this peculiarly American animal, who but a few years ago had roved over the country in vast herds almost lords of the domain.

Thus ended the fourth day of the great fair. Vast crowds had, during the whole day, thronged all the departments; the amphitheater had been jammed and packed to its utmost capacity; the mass of humanity, spread out over the whole grounds, was amazing and even startling; all had been fascinated with the magnificence and beauty of the display; all expressed wonder and enthusiasm at the varied attractions here presented; and though rich and poor, the cultivated and rude, the proud and humble, the educated and ignorant, men who command and men who serve, gentle maidens in silks and satins and laces, with soft hands, and humble women with hard hands, or stiff and thorny with ill-requited labor—though young and old, boys and girls, professional men, merchants, artisans, capitalists, farmers, laborers, divines, gentlemen at large, fancy men, roughs, jockeys, votaries of Venus and pickpockets, were all there—we did not hear of a single disturbance or unpleasant circumstance. In the name of St. Louis, in the name of the arts and sciences, in the name of agriculture and mechanics, in the name of rural and social amusements, they all, with one accord, thanked the gentlemen who had furnished the agreeable entertainment which had been crowned with such glorious success, and breathed wishes for many happy returns to the fairs to become still more successful, entertaining and glorious for the future.

FIFTH DAY—FRIDAY.

MULES.

JOHN O'F. FARRAR, *Superintendent.*

Pair of Mules for Farm for Draft Purposes.—There were seven entries; all the mules exhibited were good ones. To the superior pair of large, muscular and well formed mules belonging to Messrs. Shulherr & Co., of St. Louis, the first premium, $50, was awarded; to those of Hiram Lippy, of Madison county, Illinois, the second, a large bronze medal. It was said that an excellent pair of mules entered for this ring failed to come to time, and therefore lost the first premium that was claimed for them.

Mares, three years old and over.—In this ring there were eight entries; it was a very handsome display; they were all large and handsome looking. To Messrs. Wymore & Gath, of Clay county, Missouri, was awarded the first premium, $25; to Robert Riley, of St. Louis, the second a medal.

For Mare Mules, two years and under three.—The splendid animals of Louis Holliday, of Pike county, Missouri, took both the first and second premiums. There were in this ring only four entries.

For the best Mare Mule, under two years and over one year.—Mr. J. Turpin, of Green county, Illinois, was awarded the premium, $15, without competition. The same gentleman also received the premium, $10, for the best mare mule under one year.

For the best Horse Mule, three years and over.—Messrs. E. D. & J. W. Garrard, of Paris, Kentucky, received the first and second awards. The mules were very fine and well worthy of the premiums—the first, $25; the second, a medal.

Horse or Mare Mule for Saddle.—The first award, $25, was made to an elegantly moving animal owned by H. Lippy, of Madison county; the second, to the nice going animal of Messrs. Shulherr & Co., of St. Louis.

Horse or Mare Mule for Buggy.—To the high stepping and splendidly moving animal belonging to Messrs. Shulherr & Co., the premium, $25, was awarded.

Private Premium offered by S. S. Grant for best pair Matched Mules.—S. S. Grant, Esq., of this city, offered a premium of $100 for the best pair of matched mules. The pair owned and entered by Wm. Groshon, of this city, to which we made allusion above, won this premium, and they richly merited it. They are of fine size and immensely powerful, handsome and docile, and kind as a gentle horse, and can draw as much as a thirty ton locomotive. They are six and seven years old, bred by Wm. Squire, of Madison county, Illinois, sired by a jack owned by E. Montgomery, of Edwardsville, and together weigh about two thousand five hundred pounds. They are as perfect a pair

of mules for all work as the country can produce. Hiram Lippy received the red ribbon for his pair. In this ring there were seven entries, all very fine.

For the best pair of Matched Mules for Carriage.—The large and superior pair of Robert Riley, of St. Louis, received the first premium, $50. The hardly inferior pair of George L. Vincent, of Leavenworth, Kansas, the second, a medal.

Brood Mares, four years old and over.—To Mary Forrest, a beautiful brown mare of fine form and substance, and of superior style and speed, sired by R. A. Alexander's famous Ned Forrest, out of a thoroughbred Yorkshire mare, the first premium, $100, was awarded. She is from the stable of Dr. George R. Buckner, of St. Charles county, Missouri. She was accompanied by her two very handsome and superior bay colts, Dardenne, the winner in a previous ring, and Bonny Forrest, the favorite in a subsequent ring.

To the very fine large sorrel mare owned by J. F. Quesenberry, of St. Louis county, was awarded the second premium, a large bronze medal. We regret that we have not her pedigree; and would here remark that exhibitors, generally, are too negligent in this particular.

Roadster Mares, two and under three.—In this class G. W. Rust, of McLean county, Illinois, took first and second premiums for two excellent mares entered by him. The names of these fine animals were Kitty and Dolly. The first premium was $50; the second a large bronze medal.

For Roadster Yearling Mares.—Bonny Forrest, out of Dr. Buckner's Mary Forrest, above named, a gay, sprightly and intelligent looking filly, that gave rich promise as to what a few years will bring forth, sired by Mat Davis, was the favorite for the first premium, $30. We were happy to see Dr. George R. Buckner, who has gone extensively into the horse raising business, and who has a large stock farm in St. Charles county, Missouri, and doing all in his power to improve the stock of our state, receive so many flattering testimonials as to the merit of his stock. It is a happy augury to prove that our state will soon become as famous as Tennessee or Kentucky are in that line. The association cheers him, and all others similarly engaged, with a hearty "good speed." The second premium to W. S. Tyler, a medal.

THOROUGHBRED HORSES.

This premium called forth the most celebrated horses of the land. The Laclede race course, the handsomest in the United States, was to be inaugurated the next week. Ninety or more thoroughbreds were there. The most celebrated came to compete for St. Louis prize No. 5. It was an elegant display. Where in the world was there another place where these superb animals could have been seen by so many at the same time with equal convenience as in the great amphitheatre of the St. Louis agricultural and mechanical association? This was

the place, and now the time, for the admirers of a fine horse. The vast crowd were full of expectation. The gates open; thirteen of the most splendid horses fill the arena. They far exceed in beauty and grace everything that has hitherto been there—in elasticity of movement, in taper limbs and delicate feet, in proud form and fire-flashing eyes, in haughty looks and proud impatience, in fine hair, thin skin, high spirit and symmetrical proportions—how infinitely superior. They came down through a long line of aristocratical ancestry, whose veins have never been tainted with a single drop of plebian blood. Beautiful beyond comparison was the Knight of St. George. With a nervous stamp he smote the earth he stood upon, and seemed to spurn the air for breathing in his face. Matchless in form, faultless in symmetry, he stood there the model of a perfect horse—eye, nose, head, ear, neck, shoulder and entire countenance, what more beautiful? How well ribbed, quartered and limbed! What splendid posterns and delicate feet, and with all, what a rich mahogany bay! He partakes of the general excitement—his eyes flash, his mouth foams; he is nervous, uneasy and ceaseless in motion. He will hardly remain passive long enough to receive the honor—we will not say distinguished honor—of the blue ribbon and the first prize, $700, because he is pre-eminently ahead of anything in the ring, where they are all horses of the purest blood and of distinguished records. The Knight of St. George is an imported English stallion, by the celebrated Irish Birdcatcher, and was the winner of the great St Leger in 1854.

By Irish Birdcatcher, son of Sir Hercules, by Whalebone.

1. Dam, Maltese, by Hetman Platoff, son of Brutandorf, by Blacklock, out of grand daughter of Eclipse; 2. dam, Water Witch, by Sir Hercules, son of Whalebone, by Waxy, grandson of Eclipse; 3. dam, Mary Anne, by Waxy Pope, son of Waxy; 4. dam, Witch, by Sorcerer, son of Trumpeter, by Conductor, son of Matchem; 5. dam, Precipitate mare, by Precipitate, own brother to Gohanna, by Mercury, son of Eclipse; 6. dam, Highflyer mare, by Highflyer, son of King Herod; 7. dam, Goldfinder mare, by Goldfinder, son of Snap, grandson of Flying Childers; 8. dam, Lady Bolingbroke, by Squirrel, son of Traveler, by Partner, grandson of Byerly Turk; 9. dam, Cypron (the dam of King Herod), by Blaze, son of Flying Childers, out of Confederate filly, she by Gray Grantham, son of the Brownlow Turk; 10. dam, Selima, by Bethell's Arabian; 11. dam, mare by Graham's Champion, son of Harper's Arabian; 12. dam, mare, by Darley Arabian; 13. dam, mare, by Merlin, son of the Helmsley Turk.

Irish Birdcatcher, the sire of the Knight of St. George, got more race horses, combining both speed and game, than any stallion of modern times, and the sire of Irish Birdcatcher, Sir Hercules, held the same high position in his day. The Baron, sire of Stockwell and Rataplan, was by Irish Birdcatcher. Stockwell and Rataplan are both out of a Glencoe mare. Stockwell has been standing at 100 guineas

($500 in gold) for several years. The owner of the dam of Stockwell, the Marquis of Exeter, bred her to the Knight of St. George, believing him to be the best representative of Birdcatcher, after the Baron had left England. He got, from this cross, the Knight of St. Patrick, an extraordinary race horse. He is now the favorite stallion of the Marquis of Exeter, and he has been standing him for several seasons at 30 guineas ($150 in gold). He is the sire of the Knight of the Crescent, one of the favorites among the untried lot for the next Derby.

The Marquis of Exeter refused 1000 guineas for the Knight of St. Patrick when a yearling, and the Marquis has applied to me to repurchase the Knight of St. George, to send him back to England for his own breeding establishment. I prefer keeping him to breed to my own mares, well knowing I could not now select a stallion in all England better suited for crossing upon the Glencoe, Margrave and Sovereign mares of this country.

The Knight of St. George won the great St. Leger in England, in 1854. It was the largest St. Leger ever run for up to that time, 159 entries. This is a weight for age race, and is considered, in England, as the very best test for gameness and speed.

The Knight of St. George only ran two seasons, and his net winnings amounted to over $25,000.

Only three of his two year olds, the get of his first season in England, were trained, and all of them were winners in good company.

The Marquis of Exeter kept the Knight of St. George two seasons, and bred him to his own mares. He was then sent to the Rawcliffe stud, to take the place of the Flying Dutchman, in 185'. I purchased him that spring, and he arrived in Kentucky in June, too late to make a regular season.

He made the season of 1860 and 1861 at Georgetown. He was taken south in the fall of 1861, and moved in front of the advancing armies until he was forced into Texas to prevent his capture. He returned last fall in perfect condition; and all who have seen him say he is looking better than he did before the war.

Some of his get in this country were trained during the war, and he has out seven winners. Two two year old stakes at Patterson, New Jersey, in 1864, were won by Le Noir, by the Knight of St. George, and Saratoga, by the Knight of St. George. Saratoga also won the Saratoga stake for two year olds, in 1864, making three stakes won in the north in one summer by the get of the Knight of St. George.

Georgia Wood, by the Knight of St. George, won a race of three heats, beating an own sister to Asteroid and ran a close second to Asteroid in the three year old stake at Louisville, in 1864. Glendower, by the Knight of St. George, out of Goodwood's dam, is supposed to have as great a dash of speed as any horse in America. A colt by the Knight out of one of my Sovereign mares won a fine sweepstake for three year olds last fall at Lexington, Ky., running three heats, making the last heat in 1.47, beating Asterisk, by Ringgold, out of Asteroid's

dam, besides own brother to Matt Davis, also a colt by Revenue, and one by Lexington. This colt, by the Knight, also won a heat at Louisville last fall, in 1.46.

For the opportunity the Knight has had, and the number of his get that have been trained, we feel confident that, now the war is over, he will take his position again with the first stallions of the country.

It will be seen by reference to his pedigree, that the 9th dam of the Knight of St. George was the dam of King Herod. Stonehenge, the great English writer upon the race horse, says: "King Herod's fame now rests upon his stock, which, in the first generation, produced 497 winners, and realized more than £200,000 ($1,000,000 in gold). By a reference to his pedigree, it will be seen that he was bred almost entirely of eastern blood. I believe the goodness of a particular strain may generally be estimated by the amount of Herod or Eclipse blood in the pedigree, especially that of the former. I believe that it may generally be assumed as a rule that in proportion to the amount of Herod blood found in the 64 progenitors of any horse in the 6th remove, will be his value as a racer." Through sire and dam, there is probably no horse in America or England who combines more of the Herod and Eclipse blood than the Knight of St. George.

The Knight of St. George is a rich dark bay, without marks, full fifteen hands two inches, has extraordinary length, measures six feet around the heart, and weighs about 1100 pounds.

He has more body, and is more muscular than most English horses, and he imparts this quality to his get; some of them, out of thoroughbred mares, being full sixteen hands, with great power.

Glendower, out of Evergreen, the dam of the celebrated Goodwood, one of the fastest horses that ever trod the turf, a handsome young chesnut colored stallion, with all the points of a race horse, sired by the Knight of St. George, was awarded the red ribbon and the prize, $300.

For Thoroughbred Stallion, four years and over.—First premium, $100, to Glendower, belonging to B. F. Hutchinson, of St. Louis county, and the second, a large medal, to Reward, owned by James Blackman, Spring Station, Woodford county, Ky. They were both very fine.

Captain T. B. Hudson, of St. Louis, took the first prize for his thoroughbred two year old Bill Arp.

J. B. Clarkson, of St. Louis, took the second premium for his horse Bonhomme.

For thoroughbred stallions, one year old and under two, the sorrel colt Vidoc, sired by Crichton, and dams by St. Charles, by imported Priam, and by Hiazim, respectively, owned by W. W. Henderson, of St. Louis, was awarded the first premium, $30. Dick Richards, owned by Charles L. Hunt, of the same city, was awarded the second premium, a medal.

For thoroughbred stallions, under one year, B. F. Hutchinson's chesnut colt, by Voucher, took the first premium. Dr. B. R. Tyler, of

St. Louis, took the second premium with his bay colt, by Waterloo, out of Nannie Harris by Mahomet, dam by Glencoe.

For thoroughbred mares, four years and over, the very handsome mare Ringlet, owned by Captain B. F. Hutchinson, was awarded the first premium; and Venus, owned by C. G. Perkins, of Randolph county, Illinois, took the second. Venus, was sired by Epsilon, he by old Pacific out of Gamma's dam by Sir Richard, etc.; her dam, Princess, was out of a Diomede and Leviathan mare.

For the best thoroughbred fillies, one year and under two, the first premium was awarded W. W. Henderson, of St. Louis; the second, to Dr. B. F. Tyler, of the same city.

PRIVATE PREMIUMS.

Mr. A. McDowell offers for the best gentleman's buggy horse $100. In this ring appeared fifteen of the handsomest, finest and fattest nags in the country. They were to compete for the liberal premium offered by one of our most gentlemanly and public spirited merchants. Horses of style, spirit and speed were there, and as they swept around the arena, all showing their best traveling gaits, there was much excitement in the crowd, and they gave vent to frequent expressions of delight. The contest was finally decided in favor of the very fine horse Independence. He moves as easily and swiftly as the wind, and is truly an elegant animal. As the committee tied to him the blue ribbon, the applause was unbounded. Independence is owned by Dan Bell, of St. Louis.

Mr. F. O. Day offers for the best roadster gelding in harness, $100, and for the best roadster mare in harness, $100. These premiums were also offered by one of our oldest citizens and most successful merchants, who takes the liveliest interest in all that affects the material interests of St. Louis. The first was a splendid ring of roadster geldings. Many horses that appeared in this ring had been in the previous one. They were all that the fancy could paint or the most fastidious desire in the way of harness animals.

Pete Ham, a magnificent sorrel, of fine size, elegant action, a very handsome, steady and honest traveler, with sufficient speed, was the winner of the prize.

The crowd shouted tremendously, for there were many among them who thought that Pete should have had the premium awarded Independence.

For the best roadster mare, premium by the same gentleman. The contest soon narrowed down to a strife between the iron grey mare Puss, and the dapple grey mare Dixie. They are both magnificent animals, and in size, power and action are pretty equally matched. Equal in other respects, it was decided that speed should be the test. For some time this test was undecisive. Finally, the fast, powerful and stylish Puss broke, while Dixie remained handsomely at her work. Dixie's honesty and bottom proclaimed her the victor.

Thus ends the fifth day of the great fair. The ample accommodations of the amphitheatre had been tasked to the utmost. But what a display had been witnessed there, of splendid matched mules, of fast roadsters, of magnificent thoroughbreds! and could such another entertainment have been offered or presented? The people all thanked the foresight and magnanimity of the founders of the association, and equally thanked the present directors, in that, when the association was well nigh abandoned, they came to the rescue, and, in the face of the cholera and other adverse circumstances, generously gave their time and money to further the enterprise, and would listen to no such word as fail; and in that, when all shook their heads at the fair of 1866 as a matter of doubtful issue, and abandoned the cause while their laurels were yet fresh, they did bring their "courage to the sticking point," and did not fail. St. Louis fairs are now universally acknowledged to be of national significance.

SIXTH DAY—SATURDAY.

SWEEPSTAKES—CATTLE.

Best Bull of any age or breed.—There were twelve entries, presenting a grand and magnificent spectacle. The first premium, $300, was awarded to the bull Sweepstakes, a very elegant Durham, two years old, belonging to H. Pickrell, of Harristown, Macon county, Illinois. The second premium, a medal, was awarded to H. Larimore, of Fulton county, Mo., for his bull Lord Napier, six years old. The young fellow who bore off the big prize over the heads of aged competitors was a picture of beauty, weighing near twelve hundred pounds.

Sweepstakes is by Airdrie (2478) out of Cordelia, by Dandy Duke (2691). For sixteen crosses, see pedigree in full, page 197, vol. 7, A. H. B. Lord Napier's pedigree is as follows: He took the first prize as a yearling at the fair of 1860, calved May 10, 1859; got by Red Jacket (3?31) out of Missouri, by Renick (903); Mary Tarlton by Birmingham (265); Peg by Almonte (1190); Cherry second by Oliver (2387); Fanny by Goldfinder (2966), by Melville, full brother to Milo (4478), by Tecumseh (5409), by San Martin (2599), by Pluto (825).

Best Cow of any age or breed.—First premium, $200, was awarded H. Larimore, of Fulton, Missouri, for his beautiful cow Ida Lee; the second premium, a medal, to J. N. Brown & Sons, for their hardly less beautiful cow, Grace Young; her pedigree is previously given.

To L. G. Collins, of Lewis county, Missouri, a complimentary award of "worthy" was made for the fine display made by his Devonshire bulls, five in number, there being no competition.

For Devon cows, George P. Strong won the sweepstakes premium, $35, with his splendid cow Rosalie.

MULES.

In this ring, and a magnificent one it was, there being nine entries, the first premium, $75, was awarded to A. Shulherr & Co.; the second premium, a large bronze medal, to H. Lippy, Madison county, Illinois.

For the best mare mule, sweepstakes, $50. The first premium was awarded the superior mule of Wymore & Garth, of Clay county, Missouri; the second to William Groshon, of St. Louis. Both were first class animals.

For the best horse mule, and a better it was impossible to find, William Groshon won the first prize, $50; A. Shulherr the second.

The sweepstake, $75, for the best jack, was won by Mammoth Warrior, owned by Rigdon Quick, of St. Clair county, Illinois; the second by General Grant, owned by W. J. Davis, of Lasalle county, Illinois They were both very superior in size, strength, and appearance.

Of all the entries made for the sweepstakes, $75, for the best jennet, R. C. Shackleford, of St. Louis county, received both the first and second best premium.

HORSES—OPEN FOR ALL BREEDS.

All the choice stallions would enter this ring—those who had won premiums and those who as yet had won none. All were invited to compete. Interesting and exciting it certainly would be. The laurels here won would survive the winner. The compactly packed mass in the amphitheatre were on the qui vive to see the issue. Another moment and the following champions stand before them as competitors for the distinguished honors of "bearers off" of the sweepstake prize of the great fair of 1866:

B. Woods, Madison county, Illinois, Little Billie.
William H. Givens, Pike county, Missouri, John Morgan.
E. Fozzard, Cass county, Illinois, Billy Sherman.
J. J. Nichols, Knox county, Missouri, Iron Duke.
Rigdon Quick, St. Clair county, Illinois, Royal Bill.
A. Anderson, St. Louis county, Missouri, Blackhawk Prince.
J. T. Rice, Alton, Illinois, John Bell.
J. W. Wymore, Clay county, Missouri, R. E. Lee.
W. W. Henderson, St. Louis county, Waterloo.
H. S. Compton, Muscatine, Iowa, Sam Kirkwood.
B. F. Hutchinson, St. Louis county, Glendower.
W. Bowers, Alton, Illinois, Yankee.
James Blackman, Kentucky, Reward.
J. W. Layne, Lafayette county, Missouri, Red Eagle.
M. D. Smith, Brookfield, Illinois, Orion.

J. W. Redman, Madison county, Illinois, W. T. Sherman.
Tom Foster, Bunker Hill, Illinois, Scotland.
A. Anderson, St. Louis, Prince Albert.
A. Anderson, St. Louis, Blackhawk Prince.
J. J. Nichols, Knox county, Missouri, Michigan Chief.
John Kellam, Jacksonville, Illinois, Sweet Briar.
W. H. Beverly, Atlanta, Illinois, White Mountain, second.
D. E. Beatty & Sons, Jerseyville, Illinois, Sucker Boy.
Barton & Lawrence, Pleasantville, Kentucky, Shakespeare Jr.
Daniel Meyers, Salem, Illinois, John Bell.
Samuel Ewing, Sparta, Randolph county, Illinois, Melburne and Windsor.

Here was a warm contest. Who would be the winner? was the general inquiry. Here were so many fine horses that it was a difficult problem. When speeding hoofs cast particles of sawdust in the air, when the wheels spin around the arena with a whizzing noise, when horses and grooms become excited, the spectators become excited too, and cheer after cheer echoes through the immense building, till finally it is filled with one continual round of applause. Panting and smoking, they are now drawn up before the pagoda. The magnificent Waterloo, sired by imported Yorkshire, dam Topaz, by Glencoe, received the blue ribbon and with it the first award, $300; the inimitable Shakespeare received the red ribbon, and with it the second award, a large bronze medal.

Sweepstakes for the best Gelding—Among the numerous entries, all of which were very fine (it would be difficult to collect a finer set of horses anywhere), the premium, $75, was awarded Mose, belonging to S. A. Hatch, of St. Louis, a large, powerful, stylish and well built horse, sired by Sovereign, out of a mare by imported Margrave; the second to Independence, owned by D. W. Bell, St. Louis. The sweepstake for the best mare was warmly contested by sixteen mares. Among them were those that had several times taken premiums in previous rings. All gaits, all qualities, all merits of the respective animals are thoroughly tested to the satisfaction of the judges, and to the amusement of the spectators. The awards are made thus: to the invincible Dixie, of R. S. Carr, the first award; to C. J. Perkins' Venus, a very fine mare, a thoroughbred, who has been mentioned before, the second award.

STALLION RACE.

We have seen the contest in the arena for the fastest trotting stallion; that Pilot Temple made the nine rounds in the fastest time, and received the $1000 prize; we have seen his competitors—Bashaw Jr., Sam Kirkwood and Gladiator—there, and have heard the respective time they made there, and that that "time" was nearly equal. The friends of the three last named horses were dissatisfied at the result. They said they came to trot for a prize—to trot on a track, not in an

arena, covered with sawdust, where a horse could not once stretch himself. The directors, with that liberality which characterizes all their actions, and that all might be satisfied, offered an additional and extra premium of $500 for the same horses. They were to trot on the outside track. It was so announced by the herald, and soon a large crowd collected to see the race. The vicinity of the track presents an animated scene. Men, boys, women and gentle maidens are there; hostlers and stable boys mount upon the stalls and wagons that line the further side of the track; the grooms drive their smoking steeds up and down the track, or stop and scrape away the sweat from their panting sides, or, with a wet sponge, clear the coagulated foam from their mouths and nostrils. They are warming up. The judges have mounted their lofty stand; they have watches in hand; the time is up, and all is ready. Bashaw Jr. is called; he comes down the stretch at full speed, with Perry in the light sulky behind. With a powerful stride, ringing wheels, and rattling sound, he passes the line, and the drum taps. As far as the eye can reach he keeps fairly and squarely at his work. Soon he is seen coming down the last quarter beautifully; nearer and nearer he approaches, till he has passed the judges' stand and the line at the same time; the drum taps again; he has not made a single break, and has been honest to the last—time, 2.3¾. Pilot Temple started next. He performed well—time, 2.6⅛. Sam Kirkwook next. He travels smoothly and well—time, 2.8½. Gladiator last. He is a powerful and fine horse—time, 2.20.

Bashaw Jr. was proclaimed victor, much to the joy and triumph of his friends. He had redeemed himself, and re-won the laurels lost in the amphitheatre. To him was paid the $500 prize in lieu of the $1,000 prize, which his friends claimed should have been awarded him.

Sweepstakes, $75, was taken by D. E. Beatty, of Jerseyville, Ill., with his handsome and promising sucking colt, Phil. Sheridan; the medal by B. F. Hutchinson, of St. Louis, with his fine colt by Voucher.

The sweepstake premiums, $50, for saddle stallion four years and over, were taken as follows: First to Joe, owned by N. Montgomery, of Madison county, Ill.; the second, a medal, to Drennon, owned by W. D. Bonta, of Pleasureville, Ky.

For the Best Saddle Gelding, $30.—It was a splendid ring. The horses were all fine, and moved with the greatest ease and grace. Some changed their gaits at a moment's notice. It was really surprising to see the ease and dexterity with which it was done. Some of them galloped, ran, paced and trotted in quick succession, and each movement or change of gait was made with such ease that either one of the gaits might have been taken for a natural gait. Some of the riders also were much admired by the spectators for the ease and grace with which they set their horses, and for the skill with which they managed them.

At the end of this pleasing spectacle, the first premium was

awarded Frank Golddust, owned and ridden by Merriwether Lewis Clark, Jr., of Louisville, Ky.; the second to Cloud, owned by B. F. Grant, of St. Louis.

There was also a second premium of $100 for the best saddle horse. It was offered as a private premium by one of our most liberal and patriotic citizens, Mr. Ben. Lewis. The array of horses was very fine. Many were the same as in the previous ring. The magnificent Frank Golddust, a perfect gem of a saddle nag, was again honored with the first premium. He was the most superior, where all were superior. The following were the entries in the above mentioned ring:

FIRST RING.

B. F. Grant, St. Louis, Cloud.
John Finn, St. Louis, Gray Prince.
H. L. Downs, St. Louis, Darrell.
John Busby, St. Louis, Dave.
J. S. Busby, St. Louis, John.
George Deagle, St. Louis, Don Juan.
J. R. Clark, St. Louis, Billy Button.
Thomas Foster, Bunker Hill, Don.
J. M. Bower, Scotland county, Mo., Abe.
D. F. Leavitt, St. Joseph, Abe.
John Busby, St. Louis, Abe.
T. T. January, St. Louis, Pilot.
M. L. Clark, Kentucky, Frank Golddust.
Messrs. Garrard, Paris, Ky., Waxy.
T. Bartlett, St. Louis, Abe.
G. W. Billings, St. Louis, Diamond.
W. Aiken, St. Louis, Dick Roper.
C. January, St. Louis, Napier.
J. B. S. Lemoine, St. Louis, Gazelle.
Stephen Lupe, St. Louis, John.
Henry Hedges, Vermillion county, Ill., Lily.
H. Ashbrook, St. Louis, John.
Shulherr & Co., St. Louis, Bill.
J. Barkley, Marion county, Mo., Joe.
M. J. Clark, Monroe county, Mo., Jim.

SECOND RING

B. F. Grant, St. Louis, Cloud.
G. W. Billings, St. Louis, Diamond.
H. L. Downs, St. Louis, Darrell.
G. W. Goodlett, St. Louis, Bob.
John Buckley, St. Louis, John.
L. R. Murphy, St. Louis, Tyler.
John Finn, St. Louis, Prince.

T. Foster, Bunker Hill, Ill., Son.
J. Neill, St. Louis, Fannie.
V. Beverly, Atlanta, Ill., Grant.
D. F. Leavitt, St. Joseph, ——.
T. T. January, St. Louis, Pilot.
J. King, St. Louis, ——.
M. L. Clark, Louisville, Kentucky, Frank Golddust.
Messrs. Garrard, Paris, Kentucky, Waxy.
W. D. Bonta, Pleasantville, Kentucky, Damon.
J. M. Rowan, Scotland, Missouri, Abe.
N. Montgomery, Madison county, Illinois, Joe.
H. Hedges, Vermillion county, Illinois, Silas.
S. Berkley, Marion county, Missouri, Joe.
W. Aiken, St. Louis, Dick.

The next exhibition was for the best saddle mare. There were thirteen entries. All were superior animals, and made a splendid display. To be pronounced the best mare among the lot would indeed be a distinguished honor. After due consideration, however, the mare of H. J. O'Neil procured the first honor; that of J. January the second.

The last performance of the day was

RIDING.

Boys under fourteen years of age, on ponies.—First premium, $25, second premium, $10. The following were the entries:

Name.	*Residence.*	*Age.*
Saml. H. Phillips,	St. Louis,	13 years
Fritz Walter,	do.	9 do.
L. Deagle,	do.	8 do.
Clay Larimore,	do.	9 do.
Willie Ashbrook,	do.	12 do.
Ashton Lemoine,	do.	12 do.
N Groshon,	do.	7 do.
H. Doubert,	do.	13 do.
W. T. Down,	do.	2 years, 11 m.
All. January,	do.	13 do.
John S. Scholl,	do.	13 do.
F. S. Espenchied,	do.	12 do.
C. Lauff,	do.	13 do.
J. Coole and Wm. Coole, twins,	do.	13 do.
Charles Coole,	do.	13 do.
Thomas Coole,	do.	13 do.
D. D. Mace,	Columbia,	.. ..
John Blow,	Carondelet,	10 do.

This was exciting. Their ponies were spirited and handsome.

Cheered by the crowd, the boys were soon urging their ponies to the top of their speed. They rode boldly and with recklessness. Several got a tumble from their steeds, but no damage was sustained nor bones broken. They even seemed to enjoy the fun, and would remount and commence the sport over again. After they had enjoyed the fun for some time, it was announced that Clay Larimore had been pronounced the best rider, and entitled to the first premium, $25, and that Ashton Lemoine was the second best, and entitled to the second premium, $10.

Thus ended the sixth day. The people seemed not yet to have had enough. The programme had been varied and entertaining. The sweepstakes premiums had been awarded with great judgment, and the best discernment. The saddle horse rings had been superb, the stallion race exciting. It had been one great carnival week—a carnival for pleasure and excitement. The sameness and insipidity of the objects and pursuits of the denizens of our great city had been changed, their capacities and desires, both bodily and intellectually, had been gratified; all had been diverting and entertaining. There, too, were the works of nature—how beautiful to contemplate! Animated nature in all its forms; the varied and beautiful products of our common mother earth. All that was curious and wonderful in mechanism, to lighten weary toil and make industry triumphant, and all that the genius of our young country had as yet produced in the way of fine art.

SUNDAY.

The directors, with that generosity of sentiment and feeling which is apparent in all their acts, with that extended view of existing circumstances, and of the wants and requirements of the community, of which the association itself is so able an exponent, determined that the gates to the grounds and that the doors to the various departments inside should remain open on Sunday, thus affording the opportunity to many to see on that day what they had been unable to witness during the week. And why not? Were not here in this varied display living and visible proofs of the existence and attributes of the Creator? Were not here evidences of the degrees of perfection, of excellence, and of relative unity of the universe? Was not here to be found no small portion of that gradual and almost imperceptible chain of existences, both animate and inanimate, which is the strongest argument in proof of the "unity of the Deity?" What better place could have been offered to adore and worship that great and good Being, who in this, our state of discipline and probation, had here on these grounds disposed all around man so many evidences of the wisdom, the skill and benevolence of His great and overruling intelligence, to alleviate man's necessary and unavoidable evils?

But few persons visited the grounds in the morning, but in the afternoon several thousand went out. The several departments remained

open, but there was nothing done in the arena, and there was no music, except piano and organ music in one of the halls. The day passed off agreeably and satisfactorily.

MONDAY.

On account of the unprecedented week, and on account of the number and magnitude of the displays, and the time necessarily required to be taken for the determining the rightful owner of a prize in a ring, where often were several animals nearly equally matched, a number of premiums, advertised in the programme to be competed for, were unavoidably passed over till the day above named.

As usual, on Monday a large crowd collected at the fair grounds. Much of the stock and many of the other articles in the different departments had been removed, but the exhibition to take place that day was by no means uninteresting. Several contests for speed between "crack horses" were to come off on the outside track.

The first was for the St. Louis prize No. 2, for the fastest five year old horse, mare or gelding, free to all, $400. There were numerous entries. The judges, after they had mounted the stand and all was ready for the race, announced that all the horses should go together. Mr. N. J. Colman, the owner and driver of Puss, loudly protested against the decision. He said that he was to drive his own mare, that he proposed to do it fairly, that she was young and unaccustomed to the track, that he wished no jockeying—a fair race, etc. After some opposition and considerable delay, it was at length decided that all should go singly, and to time.

Puss started first. She traveled well and performed honestly, making the round in handsome style, in two minutes and four seconds. None of the other horses came up to this time, and she was proclaimed winner of prize No. 2.

The next contest was for the private premium by Henry L. Foote, for the fastest pacing horse, mare or gelding, in harness, $100. This was also quite a spirited contest, there being numerous entries. There were many conjectures and sage surmises by the knowing ones as to which would be the winning horse. The excitement increased as the respective horses came in and their time was announced. The race concluded, William Billings' powerful built little bay horse, Ace Diamond, was pronounced victor—time, 2.3½. Patsey, owned by J. F. Jarvis, of Madison county, Illinois, lost the race by one second.

For the St. Louis prize No. 6, for the fastest double team, free for all, $500, there were ten entries. There was much speculation as to which would be the winner. All the contestants were of approved speed, and there were among them those for which thousands of dollars had been paid. The sequel proved Dixie and Tackey, both of whom have frequently been mentioned in the previous record of these pages to be the fastest double team. To them was awarded the prize,

$500—time, 2.12. They are very superior animals, a team such as one meets with once in ten thousand times. Their owner is R. S. Carr, of St. Louis.

BEATEN HORSES.

Free to all except the winners of the $1,000 and $800 premium. St. Louis prize No. 7, $500.

R. S. Carr's Dixie was the fortunate competitor for this prize, making the heat in beautiful style—2.6½. Dixie is of fine size and substance; well muscled and of immense power; is full of action, and moves with energy, nerve and beauty; is honest and of superior bottom. She is dapple gray, and, in fine, is a perfect picture of the modern buggy or trotting horse.

THE MODEL FARM OF W. L. LARIMORE.

Having been appointed by the St. Louis agricultural and mechanical association a committee to award the premium for the best improved and most highly cultivated farm, not less than five hundred acres, we, the undersigned, have decided upon the farm and improvements of W. L. Larimore, Esq., of St. Ferdinand township, St. Louis county; and in giving our reasons shall enter somewhat into detail, that others may emulate his example and strive to excel.

The farm under consideration is situated west of north from St. Louis, eleven miles from the courthouse, between the Bellefontaine turnpike and the Columbia bottom road, in a section highly favored by nature, beautifully rolling, and very fertile. There are a number of wave-like ridges running parallel with the Mississippi river, distant from each other about one-fourth of a mile, sloping so gradually from the rounded summit to the small valleys, through which lasting spring brooks meander, that almost every foot of the entire farm can be traveled over with horse and buggy. As these main north and south ridges are intersected by other depressions at irregular intervals, the land presents every desired exposure to the sun for the successful cultivation of all kinds of crops; and should the land ever be in demand for a village or town, a more desirable location could hardly be found presenting so many beautiful, commanding building sites. Every portion of the farm is thoroughly drained; nor is there any standing water, except the spring-fed artificial ponds, arranged for supplying stock water. In the subdivision of the farm commendable taste has been displayed in the location of the dwelling upon a commanding elevation, with a beautiful lawn of some thirty-five acres, embracing a variety of full-grown forest trees to the south of the house, with the several pasture lots, barnyard, and lawn, cornering into a spring-fed artificial pond, constructed to exclude all drainage from the barnyard, and supplying pure, cool water for stock at all seasons.

The best farm should possess the following advantages: Good soil, complete and thorough drainage, abundance of stock water and shade well distributed, good fences, good buildings substantially built and conveniently arrayed, with a view to the best adaptation to the purposes for which they are to be used, and several conveniencies for doing the farm work advantageously. The farm should be in a good state of cultivation, and well supplied with agricultural implements and labor-saving machinery.

Your committee are satisfied that, although some farms in the

county may be superior in one or two of the above named points, there are none which, taking a majority of these points into consideration, will compare with this.

The farmer who may, for one or more seasons, exhibit the best yield of any kind of grain, fruit or vegetable, is not necessarily "the best farmer." He may have made a specialty of that particular branch, and forced its growth, probably, to the partial neglect of all other departments. Though this is principally a meadow farm (hence in the best possible condition for any kind of crop the coming season), other departments are represented in a creditable manner.

The soil is of the bluff formation, presenting a fine, pulverized, reddish-brown marl. For many purposes this soil is superior to that of the alluvial. It retains moisture much longer, is less affected by protracted seasons of either excessively dry or wet weather, and is well adapted to all the purposes of the farmer for the growth of all the grains, grasses, fruits and vegetables that flourish in this latitude.

The meadow farm proper embraces five hundred acres in one inclosure. This is high, gently-rolling table land, and traversed by two spring brooks, one of which empties into the Mississippi, the other into the Missouri river; hence it will be seen this is the dividing ridge. Though elevated, and presenting a beautiful landscape view in every direction, the slopes are gradual, and the land all tillable. The Spanish pond (covering about sixty acres), a popular place of resort, adjoins this meadow farm on the north.

As to productiveness, we may state that Mr. Larimore has sold as high as $24,000 worth of hay from this farm in one season, and another year it produced 10,000 bushels potatoes. There are five very large hay barns upon the premises, with a capacity to protect from the weather nearly the entire crop, and thus enable him to market his hay when its suits his convenience, and take advantage of the market.

The dwelling is a neat, substantial brick, two stories high, 32 by 42 feet, with a wing extending north 44 feet. The house fronts the south, and, being upon an elevated site, presents from the handsome two-story porch in front (26 feet long), or from the roomy observatory above the center of the house, a beautiful landscape view of the surrounding country and of the handsome lawn in front. Double doors and large windows, extending to the floors, open from the hall, also from the front rooms, in either story, upon the porch. The entrance to the house from the front is into a hall, 10 feet wide; to the right, through wide, arched sliding doors, you enter the front parlor, 16 feet square, connected with a back parlor, same size, by wide sliding doors, making really one room, when desirable, 16 by 32 feet, with convenient access to all other rooms on the same floor. To the left of the hall is a family room, 16 feet square, connecting through doors into the dining room, kitchen, pantry, etc., all well lighted and ventilated. The rooms on the lower floor are supplied with Italian marble mantles,

and the finish and furniture of the entire dwelling is rich and costly, yet in good taste. The second story is divided into large, airy rooms, of about the same size as those below. A two-story porch extends along the wing, with doors from each of the sleeping rooms, which are also connected direct inside. Stairs connect the servant's room, at the end of the wing, with the kitchen below, and thence to the kitchen cellar, independent of the stairs in the main part of the building.

Two important features here are that every room in the house is supplied with one or more closets, leaving no waste room anywhere; another is, that every outside entrance to the house is protected by a porch or portico, all in good architectural taste. The roof is of slate, the gutters of copper; the roof is four-sided, coming up to the center, where is a square observatory, glazed on each side above the roof. Below the edge of the roof the space is open, affording light and ventilation to the extensive attic or garret, which is plastered and well finished. In the center of this observatory is an opening about four feet square, protected by a railing all around. Being directly over the upper hall and the hall stairway, by opening the windows above this serves as an efficient ventilator for the whole building.

In constructing the chimnies, the whole space between the floor of the cellar and the hearth foundation was left open, with sliding iron doors beneath the grates above, which, when opened, allows the ashes to fall into the ash deposit below, thus avoiding the annoying dust of removing them daily in the ordinary way. By this arrangement the ashes need be removed but once a year—then from the cellar, by a wheelbarrow.

The cellar is divided into seven distinct departments. Entering by the back stairway, first is the coal cellar under the kitchen; second, general kitchen cellar, for daily use; third, present use vegetable cellar; fourth, for sweet potatoes, etc., supplied with rows of wide shelves, upon which they are spread, and a stove to dispel cold or moisture, when required; fifth, a dark room in the center, for canned fruit, preserves, wines, etc.; sixth, vegetable cellar, with screens, for assorting and barreling Irish potatoes as they are unloaded from wagons, through the side entrance; seventh, the fruit cellar, with two rows of shelves, for barrels of apples, and lower shelves or skids for vinegar, cider, etc. Here is also a large hanging shelf in the center for milk the winter season; this corner room being lighted and ventilated as desirable, by double windows along the sides. The cellar is reached by two outside entrances—one at the east side of the house, from the garden, field, or orchard; another at the north end of the wing, and a third inside, from between the kitchen and dining room. The cellar is covered with a gravel and lime cement, thus excluding moisture, rats, etc., and these principal divisions are by solid stone walls. The pantry is well arranged with shelves, drawers, closets, etc., giving each article in the culinary department an appropriate place.

The dwelling house, while it has been erected of the best materials, and in the most substantial manner, with a view to making it most convenient and pleasant, as a farmer's home, will, in point of architectural design and exterior or interior finish, rank it equal to many of our best city residences.

The front yard is inclosed in a neat white fence, separating it from the lawn in front and the grounds on either side, the dividing fence between the front and barnyards being of high lattice. The grounds are well laid out, set with evergreens, with roomy dry walks, made of a cement of lime, ashes, brickdust, etc., always dry, hard and clean, and unaffected by rain.

The cistern, for supplying the house with pure soft water, is situated about ten feet from the building, convenient to the kitchen and bath room, so arranged as to readily supply the house with either warm or cold water, through pipes in connection with a heating apparatus in the large kitchen stove. The cistern is 10 feet in diameter and 20 feet deep. Between the cistern and house is a smaller cistern or filter, containing thirteen barrels of gravel and charcoal. A large drain pipe extends from the eavespout, to carry off waste water, and another from the eavespout to the filter. After passing through the filter, the water enters through a pipe into the large cistern. Here is a partition wall, extending nearly to the top, composed of brick laid in cement. Across the bottom of the cistern is a double wall either side of the partition, leaving a space the width of the cistern about three feet thick and two feet high, which space is filled with gravel and sand. There being openings in the lower course of bricks in the partition wall, the water, as it enters from the first filters, must pass down through three feet of filtering material, thence through the apertures at the base of the petition walls, thence up through the gravel, to where the thrice filtered water is held in store for family use. The pipes are so arranged that the water can be admitted or excluded at pleasure; and although only ice and snow water has been received thus far, the supply has been abundant for the entire season. Another cistern, 8 by 15 feet, situated near the garden gate, receives the water from the eastern slope of the roof Eighteen barrels of cement were used in the construction of the two cisterns and pipes. A never-failing well, with force pumps, is situated convenient to both house and barn.

The garden is located convenient to the house, gently sloping to the east, the northern half devoted to small fruit, and the southern to vegetables, with a wagon road through the center, entering by double gates at either side. This department embraces the choicest varieties of small fruit, and is admirably arranged, well supplied with trellises for grapes, posts for blackberries, raspberries, etc.

The orchard embraces the best varieties of apples, peaches, pears, quinces, cherries, etc., with a nursery containing grafted stock to supply the orchard when required. Adjoining the orchard is the large vegetable garden, yielding abundantly of all varieties.

The barn is large and conveniently arranged, with stalls for horses along either side of the ground floor. The floor of the other half and of the four-foot wide passage way is of tongued and grooved oak planks, elevated two feet, occupied by a granary for oats, corn, ground feed, etc., separated from the feed boxes by the passage way, which extends from the stairs, leading to the hay loft above, along the range of mangers the entire width of the barn. The upper floor is conveniently arranged for receiving, storing, and handling hay, corn, oats, etc., to the best advantage.

Thus, whether it is desirable to feed hay or oats from the main loft, or grain and feed from either room of the granary opposite, the best plan has here been adopted.

There are several improvements and conveniences to be seen in the location and arrangement of the farm outbuildings worthy of emulation.

The lumber yard, adjoining the barn, contains several thousand feet of lumber, embracing all kinds wanted about the farm.

The horsepower is used for sawing wood, cutting or grinding feed, making cider, etc.

The poultry yard is supplied with a high, dry henhouse, with two rooms; the partition containing fifty-five nest-boxes, one and a half by two feet, five rows of eleven boxes in each, so arranged upon cleets as to readily transfer by sliding through from one room to the other. Thus the setting hens and those with chickens can easily be kept in one room, separate from the laying hens. This building is set upon posts, elevating it one and a half feet from the ground, to exclude rats, and allow the hens a ground shelter in winter or during wet weather. In the yard are several extensive coops, with feed boxes, etc.; also, a separate house for roosts. The adjoining turkey yard is supplied with separate coops, nest-boxes, high roosts, etc., each possessing original advantages.

Of outbildings there is quite a village, embracing those adapted to various purposes: five tenant houses, carriage houses, seedhouse (for drying and storing all kinds of seeds), the implement house, the icehouse, storing a supply for the whole season; the upper story being used for harness, tools, etc.

The blacksmith and carpenter shops are well supplied with tools for making and repairing almost anything used about the farm, from either iron or wood, and, as the family are all natural mechanics, they are independent in this respect.

Mr. M. L. Larimore came from Bourbon county, Kentucky, some twenty-two years since, and has brought this farm to its present condition by a well-matured plan. Either at a glance or from careful examination, the intelligent, practical farmer will see there is no haphazard chance work about this farm; that the proprietor has studied his business thoroughly, and every department harmonizes. No one part is overdone to the neglect of any other. Mr. Larimore has dis-

played commendable originality in all his plans, and can give good reasons for doing what he has done.

General Washington said "agriculture is the most healthful, the most useful, and most noble occupation of men." The proprietor of this "model farm" entertains the same opinion. He is not only master of the situation and of his business, but each of his sons are required to graduate from this same domestic agricultural college; and, though they may engage in other branches of business at maturity, the inculcation here of habits of industry and economy, and the robust constitution gained from the nature of their farm duties, will prove of incalculable value to them in any station or occupation in life.

Respectfully submitted.

WILLIAM SIGERSON,
NATHANIEL H. PARKER,
JOHN F. LONG. } *Committee.*

ESSAYS.

ESSAY ON THE RAISING AND MANAGEMENT OF POULTRY.

[Composed by JOHN F. CAMPION, of St. Louis, Mo., for the sixth fair of the St. Louis Agricultural and Mechanical Society.]

DOMESTIC FOWL.

The fowl has been so long domesticated that we have no traces when or by what people it was first brought into use. From the very earliest period of which we have any record or writings these birds seem to have been known and in common use both as food and for combat.

Roman and Grecian writers, although they omit to mention anything about the introduction of the fowl, often speak of it as furnished at banquets, and entertainments having been given where the cock was exhibited for his combative powers; therefore, the original country from whence we have derived the primitive type is entirely unknown and it would not be of much importance to know if our stock proceeds from the domesticated birds of the ancient or the wild birds of India, St. Iago or South America, in which strong marks of similarity are to be traced to some of our breeds now in use.

The large wild fowl of St. Iago, described by Sonnerat and others, and the diminutive denizen of the jungle and wilds of Java, have many points in which close resemblance exists between the hens of those species and our domestic breeds. But climate and domestication have so changed the fowl that but few of the original marks remain. The varieties of domestic fowl that are worth our notice for general use are:

1. The Spanish—black with white face.
2. The Dorking—white and colored, with five toes on each foot.
3. The Poland—black, white, golden and silver.
4. The Bramah Pootras—white, with feathered legs.
5. The Game Fowl—muscular build and nervous demeanor.
6. The Shanghai—of great size, color various.
7. The Bantam—small size, black, white and spangled.
8. The Dunghill—all colors and sizes.

1. The Spanish fowl has long been considered as the handsomest and most profitable of all the various kinds of domestic fowl, although

lately there has been a great deal said in favor of the Bramah pootras, whose great apparent weight has great effect in bringing them into popular notice; but I judge it will be a long time before they can win the palm from the three first in the above list. The Spanish cock should weigh about seven or eight pounds, and the hen four to six. They are of beautiful form, very easy to raise, good layers and hatchers, and will always fetch double the price of any other kind except game fowl.

2. The Dorking is the same among poultry as the Devons among cattle, and are considered in England as the best for table use of any kind. The Dorking is of a good size, but short and plump—in fact, just the shape a fowl ought to be; they are very good sitters, and will often raise three lots of chickens in one season; although they are not such good layers as the Spanish, yet they are very desirable for hatching and for the table.

3. The Poland is the best laying hen in the world; and they will astonish any one—if they are kept carefully and not allowed to grow too fat—by the number and quality of their eggs; with proper shelter and feed, these hens will lay nearly every day the year through. They have been considered by some to be delicate; but I do not find any trouble in raising them; and I presume their graceful forms have caused this idea, more than any real want of robustness of constitution. Besides, most people who keep them have bred in and in too much, and thus weakened their stock. The Poland, besides being a good layer, is equal to the Dorking for a table bird; and in short, I recommend this as the best for those people who can only keep a few fowls, and raise them for family use.

4. The Bramah pootras are the soonest ready for market and will generally bring a better price, because they are so much larger than other fowl; they are also considered good layers, and they are good looking, prolific and tolerable good eating. I do not admire the bird myself, but have given the opinion of those who are considered to be good judges. The objections I have to them are their ungainly appearance, their mournful crowing, and great appetite.

5. The game fowl is mostly kept for sporting purposes; and as with horses, so with it—they have sacrificed the beautiful form of the original stock for the sake of agility and muscle. The hens of this species are considered good layers and their eggs of superior quality.

6. Bantams are kept mostly for ornament. The black, with rose comb, is the prettiest, but the pheasant variety are nearly as good; both, however, are very scarce. The hens of this species are secret layers, because the cock will eat the eggs if he can obtain them.

7. The common fowl has, of course, nearly all the qualities enumerated in the others, respectively, as they derive their origin, and good birds can be found among them by those who are judges, but, as a rule, it cannot be expected for them to possess the same traits in such perfection as the true breed; therefore I consider it best for a person,

instead of purchasing their stock promiscuously, to determine first what qualities they wish most for. If for laying, then there is not the least doubt that the Poland is the bird for him; if for raising chickens and eating, then the Dorking is the best; if for all these qualities combined, then the bird that possesses them in the most perfect state is the Spanish, with the white face; and the game, although of less size, would perhaps answer equally as well.

I will merely mention the bantams as a pretty pet to have about the yard, but is considered rather fond of eating eggs, and, therefore, rather doubtful profit. The best kinds are the black and pheasant colored; the latter are very diminutive and perfect in shape, but are very scarce; they can be obtained in Philadelphia or New York for about five dollars the pair.

Having thus presented the varieties most desirable to stock the poultry yard, the next thing to be considered is the place to keep them. This should be (if possible) on a dry knoll, so that it may be free from dampness—which is the cause of great mortality among poultry. The lot should be small (say fifty feet square for twenty fowls), and there should be a run of common to turn them out for an hour or so for recreation, and which they will enjoy equal to a lot of children let out of school for the same time. The object of keeping them in a small inclosure is to make them lay; for hens that roam at large will not only hide their nests, but soon quit laying but periodically about the spring and fall, while hens kept up will lay all the time, if proper attention is given them. The building provided for them should be warm, clean and roomy. In places where logs can be obtained, they will be found to make a fine chicken house; but, in the city, boards are the general article used. Rough boards, battoned with a tight board roof, will be found a cheap way of constructing a house for poultry; there should be a floor the length of the building about four to six feet from the ground, the roosting place to be up above, and the ground part fixed up with boxes or old baskets filled half full of sand for them to lay in. The house should be whitewashed regularly and kept free from all dirt, to prevent disease and vermin. The roof should be tight, to prevent dampness. There should be plenty of poles to roost on, to prevent fighting and roosting outside; the poles placed so that the birds can travel conveniently; also, place a ladder for them to ascend to the roost without flying and jumping about. I am particular to mention that there should be a division between the roosting and laying places, because hens do not like to lay where they roost, and will not if they can get any other place; besides it is not a nice plan to go into the roosting house after eggs. Be sure and have doors and windows, so that they can be fastened and locked, and you may prevent many a fine lot of fowls being lost, and you will often wish to keep your fowls up; if you can have an open shed in the yard it is good for bad weather, especially for the young chickens; in fact, I have found it worth while to construct one just for a shelter from the storms.

FEEDING POULTRY.

To have your hens lay well, you must give plenty of good feed, such as parched corn, a little buckwheat, oats, wheat, screenings, cracked corn, bran mixed stiff with water. Meat must be given at least once in the week, sprinkled with red pepper. They will lay enough more eggs to pay for the meat, and commonly it will increase the number two-fold. But when I speak about feeding well, I do not mean you are to fatten your fowls, because that is very easy to do with such as Dorkings and Polands, which often die of fatness. My measure of feeding is about a good handful of feed to each bird, twice in the day, of oats, wheat or barley, and about half that of corn; when feeding the latter grain I give plenty of bran. All scraps from the table should be given to the fowls, and generally will prove a good variety to them which is what fowls need. It is often found necessary to have a place fixed separate for such fowls as are to be fattened. It should be small, for the less exercise the bird has the sooner will it be ready for the table. Fowls require a certain portion of green food to be healthy, although when fed the scraps from the house, they perhaps can get along very well without. Good substitutes for grass are cabbage, greens, turnips, and even bran and hay will answer as a substitute. Barley will be found good to feed as a purgative when fowls are overfed. Potatoes are good, and may be fed hot in cold weather, and will help to make hens lay. Buckwheat is fattening, and helps to increase the fecundity of hens to some extent, but must be used with judgment, or it will be sure to fatten them. Clean water must always be furnished. The best thing for them to drink out of is a wooden trough. The vessel that holds it should have a small quantity of asafœtida nailed in the bottom, placing it first in a rag. This will help to keep fowls healthy and will prevent all contagious diseases.

SETTING OF HENS AND MANAGEMENT OF CHICKENS.

There should be kept a cock for about every twelve hens for all fowls except game, they should have one to every five or six. If the cock is old, it is best to have young hens, and for old hens, a young cock; but this does not make so much difference as some suppose. Never keep over a year a poor looking cock, but select those whose carriage is noble, who are brave and healthy. Avoid large, ill-shaped fowls; better to have a smaller kind, if of perfect shape; and they will be found much more profitable. Although there is great diversity of opinion as to the best color for setting hens, yet my experience on the matter teaches that the light (especially white) colored hens are the best for setting, and the dark, such as brown, black and speckled, for laying; indeed, I have known persons, keeping none but black fowls, not being able, out of fifty hens, to get one to set, and it spoils the Poland and Spanish breeds to let them set; while the Dor-

kings will be found careful breeders, and often raise three sets of chickens in one season. The number of eggs to be placed under her depends on the size of the hen; from eleven to fifteen is about right. Select fresh eggs, layed about the same time or as near as you can get them; choose them nearly of the same size and color. If you wish for hens, take those that are the roundest. I do not know if this rule is certain, but is stated as a fact by good authority; and from what little I have tried of the experiment, I am inclined to think it correct. Having the nests prepared by filling a box or basket half full of sand or ashes, and a little soft straw on the top, place the hens where they will not be disturbed, or cover them up, but be careful to let them have plenty of air. They may be let off once every day but the twentieth, when the hen may be fed on the nest. The eggs should not be touched, neither should the hens be troubled, for they will bring out their young a great deal better if left alone. After the chickens are hatched, they may be left a day without feeding, then give them crumbs of bread and water in a shallow dish. After two days, they should be cooped up, fed often on crumbs, and, after the first week, on screenings or cracked corn; but do not feed Indian meal, it being too heating, and kills more chickens than any other thing. When about a month old, they may be let in the yard with the other fowls.

THE TURKEY.

America is the original country of the turkey, and one would suppose it would be very easy to raise them, but they are, on the contrary, the most difficult of all poultry, in consequence of their sensitiveness to damp and confinement. The choicest kind are the bronze, their flesh being considered far superior to all other kinds. Next to them the brown and black rank as to quality. The bronze kind are very scarce, but can be obtained in New York, but at a very high price. They are a beautiful bird, and quite an ornament to large grounds, such as parks and groves around country residences. A good turkey is of a rounded shape, short legs, and vivacious in movement. They may be kept three or four years, and are in their prime at that age. One cock to about ten hens is sufficient, and even twelve hens would not be too many for common kinds.

The time when the hen turkey lays is morning, and the number of eggs she lays before sitting is about twenty. The cock must be kept separate after the hens go to laying, or else he will ill treat her and break the eggs, perhaps. They will lay the second time in the season, but not so many eggs (perhaps about twelve). The hen turkey is a good sitter, and would die before she would quit the nest if no chicks were hatched out, but any eggs that are slow in hatching she will be apt to abandon; so care should be used in having eggs all about the same freshness when you place them under her. The number of eggs to set is about twenty, and the hen should be left in some

retired place and not disturbed by any one. On the thirty-first day the chicks leave the shell, and if the weather be cold it is a good plan to put them in some warm place for a day or two. Many writers on poultry recommend a lot of useless quackery about the treatment of young chicks, such as feeding eggs, pepper, etc., but I consider it far better to let them alone, but be cautious of keeping them dry, and feed them most anything except Indian meal, and, only when sick, feed red pepper. At the time they are about two months old they "shoot the red," which is a very critical period; they may be then fed regular (till past danger) cayenne pepper or hemp seed; when they are over this spell they may be considered out of danger, and left to roam about and to take care of themselves. They are able to provide their own food, which consists of grasshoppers, seeds and all kinds of insects. Plenty of room is required for turkeys, as they love to prowl about, and if kept up will be drooping and miserable; in fact, no one should attempt to keep turkeys that has not a good, large place with plenty of grass about. Turkeys will not roost in the hen house, without a great deal of trouble, for they love the trees and high places; so the best plan is to have a pole about ten or fifteen feet high, covered at the top with boards, in the shape of a pyramid, for a roof, and cross pieces, projecting not quite so far out as the roof, nailed on the post for them to roost on; have a ladder placed for them to get up, and there will be no trouble of them straying off to roost on trees.

Turkeys should be kept up and fattened before using. Corn is as good as anything to feed them. The weight of a good, fat turkey should be near twenty pounds, and, sometimes, they may be made to weigh as much as forty pounds. The best plan in fattening poultry is never to let them get poor, and it will be found cheaper to raise them up to the proper fatness for market. Potatoes fatten turkeys well, and they are very fond of them, and are healthy. If you wish to feed Indian meal, it must be cooked a long time, or else it is injurious.

THE GUINEA FOWL, OR PINTADO.

Africa is the native country of this bird, but it is also common in some parts of America, where it is also supposed to be indigenous. Although this bird has been long domesticated, it still retains much of its original shyness and primitive habits. The cock and hen are both very much alike, but there is somewhat of a difference in hue of certain parts, but this difference does not always exist, and, therefore, we must depend upon their general manner and appearance. As these birds pair, a second hen will be neglected and useless except for eggs.

These fowls are not very profitable; the eggs are small and of a strong taste, and their cry is very annoying. The guinea fowl dislikes confinement, and, like the turkey, will not thrive unless it has fredom. The hens commence laying in May, and lay throughout the entire summer. The period of incubation is twenty-eight days. You must keep

the male bird away while the hen is laying, or he will destroy the eggs. The chicks, while young, require careful management, and must be constantly fed; in a short time they become perfectly hardy.

THE GOOSE.

Geese should never be kept where they cannot have plenty of water and grass. They are much more vegetable feeders than any other poultry. The natural habits of geese are damp meadows, and marshes, abounding in plants, and, therefore, they are migratory.

Of the ordinary domestic goose there are but two kinds in common use, whose only distinction appears to be in size and color. The best kind I should judge to be the gray, as they approach most nearly to the primitive stock; but avoid mixed colors; they will not be so prolific. It has been recommended crossing with the wild goose. This would be a difficult plan, but would improve our breed, no doubt.

One gander to six geese is sufficient. Select the gander for his weight of body and breadth of foot and steady deportment. The goose will lay about twenty eggs, and the same number may be put under a large goose to hatch, but sixteen is often enough. You can easily tell when the goose has an inclination to set, by her staying in nest much longer than usual after laying. This is also true with fowls. The eggs will hatch out in thirty days. The goslings should be kept from water a day or two, for if suffered too early to go to the water they are liable to have cramp, which often proves fatal. Although geese require water to do well, they are often raised without it; but, as a general rule, it would not be found advantageous to keep them without there is a good body of water near at hand. Then, in that case, they are hardly any trouble. They will soon learn to come home of an evening, when they should have some kind of shelter from storms, and be fed a little grain; but they should not be confined long, without you wish to fatten them. Geese are very easily fattened, being so voracious that they will eat like hogs. Potatoes and meal are the best to fatten on. Geese should be turned into the fields after harvest, where they will be fat enough in a month to kill. The old ones may be plucked twice, and even three times a year, at an interval of two months, but the young ones should be left till they are four months old. The feathers should be plucked before they are quite cold, when killed, or else they will contract a bad smell, and get matted.

Geese live to a very great age, some say eighty years; but they are not worth anything for table use after the first year, the meat being dark and tough.

THE DUCK.

There are but three kinds of ducks that are worth keeping, and these are the Aylesbury, Rouen and the Poland. Of these the Aylesbury is decidedly the best, being of good size and of a beautiful white color; the meat also is said to be better than the other kinds. The

Rouen duck is from France, where they are raised mostly for the sake of their livers, which are used for pies that are exported to all parts of the nation. The Poland duck is very large, and has a topnot; the drake is very handsome, but their flesh is not so good as the Aylesbury. Ducks are the most easily kept of all poultry, and around gardens they are of some benefit; instead of injuring, they eat up the bugs and insects that destroy plants. They are not troubled much with disease, and will feed on most anything; but they should have plenty of water. It must be borne in mind that the flesh of this bird will partake much of the flavor of the food on which it is fed. The same food should be used in fattening as recommended for geese.

The duck is very prolific, and has been known to lay an egg daily for eighty successive days, and their eggs are rich and equal to two hen eggs in puddings, etc. They lay in the night, and will resort to a regular place to lay, mostly preferring grass. Duck's eggs are thirty days in hatching, and it will always be found better to have some good old hen to sit on the eggs. The great trouble with young ducklings is their propensity to fall over on their back, from which position it is pretty hard for them to recover their feet; they are also quite helpless and unable to defend themselves from attack, so they should be kept up till able to take care of themselves. Ducks are often attacked by sunstroke, and should be kept under shelter during the hot days.

Diseases of poultry are so hard to distinguish that it would be useless to give any account of them. The best method is, when you see them drooping and looking sick, to give them cayenne pepper in small quantities. If they have diarrhea, give two or three drops of laudanum twice each day, change the food and secure them from damp and dirt. Always be careful and keep the yard clean, and give your poultry plenty of good water, and they will not be troubled much with disease.

ESSAY ON THE REARING AND MANAGING OF HORSES AND MULES.

[Written by JOHN F. CAMPION, of St. Louis, Missouri, for the sixth fair of the St. Louis Agricultural and Mechanical Association.]

The raising and improving of useful and beautiful animals is a study well worthy the attention of the greatest mind, and does not only create joy for oneself, but is a lasting blessing to mankind which will exist long after we leave this world. We, in this country, have reason to be grateful to those who have devoted mind, time and money to this cause, but they who have done so much have not done all. It is left for us to use to good advantage those benefits which may be derived from their labor. As I have once before, in my address to

the farmers of Missouri, stated, so I again try to impress upon the minds of those who attempt to raise the horse in perfection, that every and each country has its specialty, and its does not show much learning or native talent for Americans to try and imitate the stock raisers of England or Holland. Should we not rather lead, as we do in almost all useful enterprises, and especially with regard to the horse and mule? This country seems to have a climate so well adapted for the development of bone and muscle, that instead of trying to raise a heavy, cumbrous animal, which it is a great difficulty to maintain, everything is propitious to our developing, to the utmost perfection, the elegant symmetry and hardy endurance which is so much admired in the horse.

Of late years there has been a great mistake made in the breeding of the blooded horse, and there has been too much lost sight of—those other qualities, which are held in much esteem by the true lovers of the horse, beauty of form and endurance—and horses have been raised solely for their capacity to run, at an early age, two or three miles at unusual speed. A man that raises and uses the horse merely for gambling—to win a race—is not the true friend to its development; and if we look to the principles which were advocated by those who first patronized the race track, we will find it was not instituted for the purpose of winning certain sums of money, but for the improvement of the blooded horse. But, in our fairs, we yet may see true discrimination shown; and the prize does not, generally, go to the weedy colt that, without any appearance to recommend it, is capable of getting around the ring at a very precocious pace; neither do those fatted pets of mules, that lack the proper activity, take first premiums.

In raising the horse consideration should always be given to the kind of animal best adapted for the purpose for which it is intended, and not to indiscriminately breed with a stallion because he is cheap, large, or of great pedigree—because a horse may have any of these qualities and be a very poor horse for your purpose—but look first to the work you intend him for, and then try and find the stock best suited for it.

There may be considered to be three kinds or divisions of horses, to which all others more or less belong.

First, the race horse, with nervous activity, attenuated form, but muscular development. He has the marks of ages of care and attention. Those parts which for his uses would be superfluous, are reduced to the lowest point, while those that tend to speed have been brought to the greatest perfection—a great success to careful training; and such a reward is always sure to those who use and concentrate those wonderful powers given us by a wise and bountiful Providence.

Second, the roadster, whose long, elastic pastern, activity and fire, are derived from the blooded horse; while a broader back and disposition for quiet work come from a mare of common breed. Fitted

both for saddle and wagon, he is, perhaps, more generally useful than either of the other kind.

Third, the team or draught horse; is quiet and patient, should be ready to pull when a more finely bred horse has given it up, and able to stand hardship, and, perhaps, abuse; to live on the roughest fare with content, and ever to thrive under all difficulties. These are the desired qualities for him to possess. Now, it is very plain to be seen that there are almost opposite qualities to be wished for in these different classes; and so, although each might be a good horse in its station, yet neither would the racer be more useful at the plow than the cart horse on the race track.

As to size, it is generally desirable to have a horse tall rather than short; but it much depends on the build. Thus, I would choose always the shorter horse, if better built; and, again, there is danger in a large horse not being so tough as a smaller one. But the size most all men prefer is about fifteen and a half or sixteen hands high; but I notice there are more beautiful horses under fifteen hands than over.

Almost any one can soon cultivate "an eye for a horse," and can tell if a horse is good or bad proportioned at a glance, just as easy as we tell if a man is good or ill looking; and in raising horses the good looks must have due consideration, for the rule of nature is that "like produces like." I will also remark—what I have often heard others repeat—that it is just as cheap to raise a good sized, handsome animal as a diminutive and ugly one, and the profit on the side of the former is threefold. and often more.

The color to be preferred is always bay or brown; no matter what our own choice may be, these are considered by all judges as the best colors. But here, as in size, first consideration must always be given to the build of a horse; color is of the third consideration. But, of course, there are some colors that are not to be thought of; such as claybank, dirty white, cream, etc. Sorrel and chesnut are sometimes more beautiful even than bay; but these are peculiar cases, where the horse has a most remarkable fine hide or has had great care.

We should never try to raise colts from a team we are working, because this tends so much to the deterioration of stock, and, in fact, is one of the principal causes of the present deformity so much to be regretted in our horses. But farmers should keep one or more old mares, chosen for their qualities as breeders, that, during their pregnancy, may be let loose in some pasture or yard where she may be quiet. Such an animal is always useful; and I have found it of great profit to have one to put in the carriage when I did not want to stop my team from farm work. Besides, mares in foal, at plowing time, are such a nuisance that I cannot see how farmers allow themselves to be bothered with them more than once.

The mare should be large, patient, and may be old. It is best, if you

purchase mares for raising colts, to find out something about the horses she has raised, and then you may form a pretty good estimate of her capacity. The stallion, chosen for his beautiful shape and qualities, may be, and, in fact, should be, rather smaller in proportion to the mare, and if the mare is young, he should be of full age, and if she is old, he should be rather young. The mare is twelve months with foal,* and she may be used at light work till the last two months; but never let a stranger drive her, or let her be put to any hard pulling, or she might strain herself and inflict a severe injury on her colt. She must be well cared for, and even petted a little—good feed in plenty, but not too much corn or grain. In summer she may be turned out in a good pasture where there is shade, but be careful and have a fence around that she will not attempt to jump.

About foaling time the mare should be kept up in stable, where there is no railing or any kind of obstructions that would interfere with her comfort; she should be loose, and have a bed of straw. If a valuable animal, it is well to have a man sleep near her, but she should not be interfered with only in case of necessity.

If the colt, when first born, shows weakness in any part of his legs, a bandage should be neatly applied, but not so tight as to prevent circulation of the blood, and the limb may be rubbed with liniment of a strengthening kind. His feed for the first year should be good, and plenty of hay and grass; second year add grain, and stint them a little in feed; the third year feed the best you know how, and clean night and morning. In feeding, however, let me remark that you must always let your horses clean up what they are fed before giving them more, or you will learn them a very bad habit. The best way is to feed often and not a great quantity at a time. Avoid all nostrums, just as much as you would for a child: the best and only means for increasing power in horses is good care and proper exercise.

There should be no breaking of your colts, for they should be so handled and raised as to be ready for harness or saddle when the time comes. Let them be haltered when very young, bridled at one year old, rode at two, harnessed at three, and worked at four. When I say ride at two, I do not mean general riding, but a light boy occasionally to give them a run or trot. A great fault is working colts too young; better let them stay another year than work at three years old, and they will fill out and always prove better animals ever afterward, and have a great deal better constitutions.

In the first handling of young animals much depends; and this should never be left to an ignorant man, but the owner himself had better give the first few lessons of training. Great patience is required, and remember that you show your power and capacity in kindness, forbearance and persuasion. I hate to see a man go at a colt with a stick or whip. It argues little for his power of mind; although I do not mean to say but there are times when a colt wants a good whipping,

* Except the first time, when it is usually a month sooner.

but it is not often, and then it should be done quickly and effectually, taking good care that he knows what he gets it for.

Colts turned out together in a large pasture will have good exercise, and should be indulged in it as much as possible, but if you find any very vicious or given to romp too much, remove them at once.

A colt that is to be a trotter should not be used much till about five years of age, because then—and not often before—a horse has arrived at full maturity, and is capable of being trained severely. Such a colt must never be run, but always—in and out of harness—encouraged into a trot. In exercising, a horse lead is inclined to trot most, even when the one you ride is galloping, and it will be found the best way to commence with young trotters, by thus leading them with the halter, and check them by a sharp pull when they go to break.

A blooded horse will arrive at maturity a year or so before other stock; but still, as I before mentioned, it is best to be sure that the horse has its proper growth and strength in a natural way, than that he should be forced to show speed that may use him up in a few years.

Colts must be bitted, and a gearing arranged, when they are two years old, to keep their heads up and help to develop the chest; also, have the racks of your stables high enough, so that the horses will have to reach up to get their hay, for the same purpose. Never allow your colts to be scared if you can help it. This is of great consideration, and half the bad traits in horses arise from their being abused and scared while young; but if a horse shows fear of some object, encourage it, by petting, to go up to it, which he will always do if you have patience. I have thus taught horses to go through fire, and do many things that at first I thought hardly possible. Teach your horses to love you, and you will develop traits that you will never find in a horse otherwise. In pulling with a young team, be cautious not to attempt anything too hard for them; thus, when they are put at a hard pull in after life, they will not be apt to balk, but, not knowing what it is to fail, will pull with wonderful power. As an illustration of this, I once saw an old team of horses, of good size, stalled with a heavy load. After many unsuccessful attempts to pull the wagon out, I desired the man to take off his team, and I brought a fine young mare, that had never been allowed to pull without success, and hitched her to the wagon. But at first attempt it was too much for a common pull; so calling sharply her name, and giving a touch with the whip, she put all her power to a focus, and brought the wagon out. Of course the other horses, which were larger, had more capacity than the mare, but I saw that they never would attempt a desperate pull, having most likely been spoiled while young in being forced to try impossible feats, and so forever lost courage.

In raising horses, too much care cannot be spent in stabling them; but I notice that although expensive stables are often provided, great ignorance is shown in their arrangement, and one of the most general

mistakes is to have too little ventilation and light. I know many grooms think it fine to have a glossy coat on their horses all the year round, but let me assure them that it is anything but proper, and very cruel; for the long and thick hair is a cover to the horse that all the blankets and warm stables cannot equal for his comfort, and this being understood, very few, I should judge, would think of depriving him of it. To make heat enough to keep the hide glossy, ventilation has been dispensed with to a great extent, and because there are no glazed windows in the stable, light is often a scarce article in them. Stables should always be kept very clean, for there is no animal under the sun that loves cleanliness as well as the horse, and you may judge how obnoxious a lot of stale manure must be to him; besides, the gases which are formed are injurious to health. Let the floor of the loft above be tight, so that no seeds or dirt will fall to endanger a horse's sight.

In feeding horses much depends on the work they are expected to perform. The fine horse must have old hay and good, bright, full oats, with now and then some blades of fodder and a few carrots; but the farm horse must take all kinds of feed, such as hay, corn, oats, beans, bran, oat straw and fodder, and even good clean wheat straw will often be fed in case of necessity. A working horse should have his feed cut so that he can fill himself sooner and digest better, and it is found to be much more profitable to feed in that manner. Where a team is put on extra work, always increase the grain for his feed, and in long journeys, also, give a greater quantity.

In watering horses, be careful not to give it too much below their temperature, and always let the cool off before giving them a supply, except where you continue a journey; then you may give water often, but in small quantities. Use soft water when it is possible to obtain it; horses much prefer it, and I have no doubt but it is much more healthy for them. Do not use cold water to wash a horse's legs after severe exercise, especially if he is very warm. It will have about the same effect it would on a man, and I judge there are very few who would be foolish enough to bathe while heated, and the pores of the skin open; but if you want to wash your horse's legs let it be done when he is cool, and be sure and wipe them dry. After exercise the foot should be cleaned and stuffed with clay, a good bed provided, the horse thoroughly rubbed, face cleaned with a sponge, halter looked to and seen that it is not too short or long. If any bruise or sore appears let it be attended to at once.

Horses should be attended to early in the morning, such as feeding and cleaning away the manure. In cold weather it is better not to give them water till about eight o'clock A. M., as they rarely are thirsty early in the day.

The mule has long been used in America. Our beloved Washington helped greatly to introduce it into use among farmers and planters, but in consequence of its inferior appearance, and true value not be-

ing generally understood, this animal has not been raised and used as much as it should have been; for there are qualities possessed by the mule that far surpass other animals of draught. For ability to stand the heat he excels the horse, his life is at least twice as long, and he will do more service in a warm climate than the best of horses, at steady work, such as teaming, plowing and farm work in general. He is less liable to disease, and can be kept at less expense than a horse, and as to the appearance, that depends in a great measure on the stock he comes from. In some countries the mule is held in high consideration. In Spain, Portugal and Cuba they would not, on any consideration, be exchanged for horses, even for riding purposes; and I have noticed, good judges, when traveling across the plains, take a mule in preference to a good horse. In fact, there is no doubt whatever that in all warm climates the mule is superior to the horse as a working animal at hard labor; and although it is not the fashion to drive them in the carriage, I can assure the reader that they are almost as good as the horse, if bred of good mares and broke properly. Of course they never make that fine appearance, neither would I have them usurp the place of the horse as an animal of pleasure or war, but I would most decidedly urge our farmers to give their attention more to the mule, and use him more, and breed them better than has been customary. To get a good stock of mules, it is more desirable to have fine, large, well-shaped mares than such very large jacks, because the small male, chosen more for shape than size, will give better colts always. This is considered a universal rule with all animals. There need not be any fear of having small animals if the mare is large, for this has been well tried, and found to give a good-sized, well-shaped colt; while the large male and small female will, nine times out of ten, cause the progeny to be ill-shaped and sometimes worthless.

In raising mules, not so much attention need be paid; but still, care is not thrown away on a mule, and it is always better to raise a fine animal than a poor one. The mule colt should be early learned the bridle, and kept fastened up during the winter, and he will not be found hard to break. They may be worked at three, but it is not best to put them to very hard work till the fourth year. In feeding mules, less grain is required than with horses, and not quite so much attention to brushing; a good rolling in the pasture is as good to a mule as currying, and they should regularly be indulged in it. Where mules are raised in large numbers, let an old mare be left in among them, and have a bell attached to her neck, and she will be followed by the herd, and so they can be driven pretty easily. The value of a mule is generally according to size, but also depends upon the build, with good judges; fourteen hands and over are good size, although smaller ones are in demand for the plains; but mules measuring upward of fifteen and a half hands being nearly double the price of small ones, and are much more readily disposed of. The market for mules in the west and south is always good, and can be depended on with more certainty than

for horses, and I am certain farmers will find it more to their interest to raise large and fine mules than horses.

Dark colors in mules are always the most desirable in this country, although in some countries quite the reverse is the taste of the people. A brown, bay, or sorrel mule is mostly a better one than a white or light-colored one, and at least looks better, and will bring a higher price in market. It is strange, with these facts before the public of the high price, durability, hardiness and economy of mules, that they have been so little attended to and raised for market; but this can only be from want of experience, for it has always been found that a mule colt costs but half the price to raise it, and, nine times in ten, brings a third more in market; and as for its capacity, be assured it is equal to the horse in everything except display and speed, and far superior in strength, endurance and patience.

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